EDUCATION SPENDING: IMPACTS ON HUMAN CAPITAL DEVELOPMENT

A Dissertation

by

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ABSTRACT

What does it mean for a government to invest in education? Is it just spending money on schools and teachers, or does it include family benefits spending that specifically targets parents and their children who will be going to school? This dissertation expands the definition of education spending so that in addition to expenditures allocated to schools (supply-side expenditures), it includes benefits that enable all children to participate in the education system (demand-side expenditures). The simultaneous funding of both schools and family benefits, I argue, contributes both directly and indirectly to the development of a country's level of human capital, or students' level of marketable skills and knowledge. This dissertation presents evidence that both types of expenditures do make a difference for students – especially those coming from the most disadvantaged circumstances.

To evaluate how spending matters for human capital development, I develop an Education Policy Index (EPI) capturing each country's policy choices. The EPI features supply-side spending or expenditures allocated to schools for teachers and staff compensation, curriculum, and capital expenditures, as well as demand-side spending or expenditures allocated to families in the form of cash benefits, benefits in kind, and student financial aid. The political and economic factors that impact countries' spending choices, namely proportionally representative electoral systems, left-leaning leadership ideology and the strength of organized labor, are evaluated and are strongly correlated

with increases in spending on families relative to schools. How education-spending policies affect students' commitment to school as measured by enrollment rates, and how schools impact student performance as measured by cross-national assessments of skills and knowledge in 33 countries is also explored; family spending helps enrollment rates and investment in schools strongly correlate positively with student performance. Lastly, the dissertation examines how spending impacts students' individual academic and professional expectations. Case studies of three schools in a rural municipality in Mexico show that when governments invest in families, it has an impact on students' commitment to their education and their professional expectations, their social capital. This effect is especially apparent for girls. Thus, spending can have a direct and indirect effect on human capital development.

DEDICATION

I dedicate this dissertation to two rising stars who inspire me daily, Carmen and Jamila. May you face life's obstacles with grace, persevere, and make your dreams come true. ¡*Sí se puede*!

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CHAPTER I

INTRODUCTION

"One of the most fundamental obligations of any society is to prepare its adolescents and young adults to lead productive and prosperous lives as adults. This means preparing all young people with a solid enough foundation of literacy, numeracy, and thinking skills for responsible citizenship, career development, and lifelong learning."

- Symonds, et al. 2011

What does it mean for a government to invest in education? Is it just spending money on schools and teachers, or does it include family benefits spending that specifically targets parents and their children who will be going to school? This dissertation contends that both types of spending are key markers for countries that want to see their economies grow by developing their population's level of skill and knowledge – their human capital. Before students can learn at school, they need to show up healthy and ready to learn. The monies that governments invest for both purposes – helping families and providing worthwhile schools – are complements that together should make a difference for students' academic and professional outcomes.

In this dissertation I evaluate how countries spend their education funds, and I develop an Education Policy Index (EPI) capturing each country's policy choices (**Chapter II)**. Next, I explore what political and economic factors appear to be related to countries' spending choices **(Chapter III)**. I then evaluate how education-spending

policies affect students' commitment to school as measured by enrollment rates, and how schools impact student performance as measured by cross-national assessments of skills and knowledge (**Chapter IV)**. Lastly, the dissertation examines how spending impacts students' individual academic and professional expectations – their social capital – that serve as strong indicators of their human capital. Case studies of three schools in a rural municipality in Mexico provide an example of how government-spending decisions can have an effect on social and ultimately human capital development (**Chapter V)**.

Section 1.1. Money Matters

"Socioeconomic status (SES) is probably the most widely used contextual variable in education research" (Sirin 2005, 417). Since the 1966 Coleman Report "Equality of Educational Opportunity," family background has been understood to be a major influence on student performance in schools (Coleman, et al. 1966). Parents' educational attainment, wealth, or occupation has repeatedly proven to be important indicators in determining student outcomes – from their academic success to their career choice (Whiston and Keller 2004; Lindstrom, et al. 2007).

There is variation among countries in how much family background impacts student academic performance and subsequent careers. In the United States, the SES of a student's family explains 17% of the variation in student performance on the Programme for International Student Assessment (PISA) exams, compared with 9% in Canada and

Japan (OECD 2011a).[1] This difference has been attributed to several factors, notably the concentration of disadvantaged students in U.S. schools to the size of a school's community (OECD 2011a, 32). Even with these differences, however, there is little doubt that disadvantaged students around the world do not attain the level of measurable learning outcomes as their wealthier classmates. If this is the case, does spending on education make any difference for those students from families with a lower SES?

Based on the numbers cited above, in the United States over 80% of the variation in student performance and over 90% in Japan and Canada is *not* accounted for by families' SES, leaving ample space for schools and other factors to affect student outcomes. The main factor of interest in this dissertation is the role of money in education. Specifically, school funding used to provide resources and qualified teachers to students, and family-oriented funding that helps families – especially disadvantaged families – prioritize education over work or other familial demands for their school-aged children.

Spending Impacts on Schools

There has been some debate as to whether or not schools are useful for helping students build skills and accumulate knowledge. Some political scientists and economists have argued that schooling in the U.S. does little more than signal credentials or does not matter as much as the influence of parents and peers (Coleman, et al. 1966;

[1] Immigrant populations, though not directly addressed in this dissertation, do impact a country's performance on exams of skill and knowledge. Among OECD countries, "the share of students with an immigrant background explains just 3% of the performance variation between countries" (OECD 2011d, 29).

Jencks, et al. 1972; Spence 1973); others have argued that it does make a difference – especially high school and university-level attainment (Wiley and Harnischfeger 1974; Chubb and Moe 1990; Becker 1992). In the ongoing debate about the efficiency of education spending and student achievement, some key aspects of schools have been central to the discussion: teacher-to-student ratios, teachers' level of education and experience, teacher salaries, expenditures per pupil, facilities, and administrative inputs (Hanushek 1989; Harris and Ranson 2005; Ansell 2008; Dolton and Marcenaro-Gutierrez 2011).

While there is wide variation in how school expenditures are allocated, at the national level it is possible to discern some key spending categories: teacher compensation, other school expenditures (spending on curriculum and supplies), and capital expenditures (facilities). In this dissertation these categories are considered supply-side expenditures because they are allocated to the quality of the education being supplied to students. These categories are explained in further detail in Chapter II and serve as a complement to demand-side spending, or spending designed to help families get students to school and keep them there until they graduate.

Spending Impacts on Students (Both Advantaged and Disadvantaged)

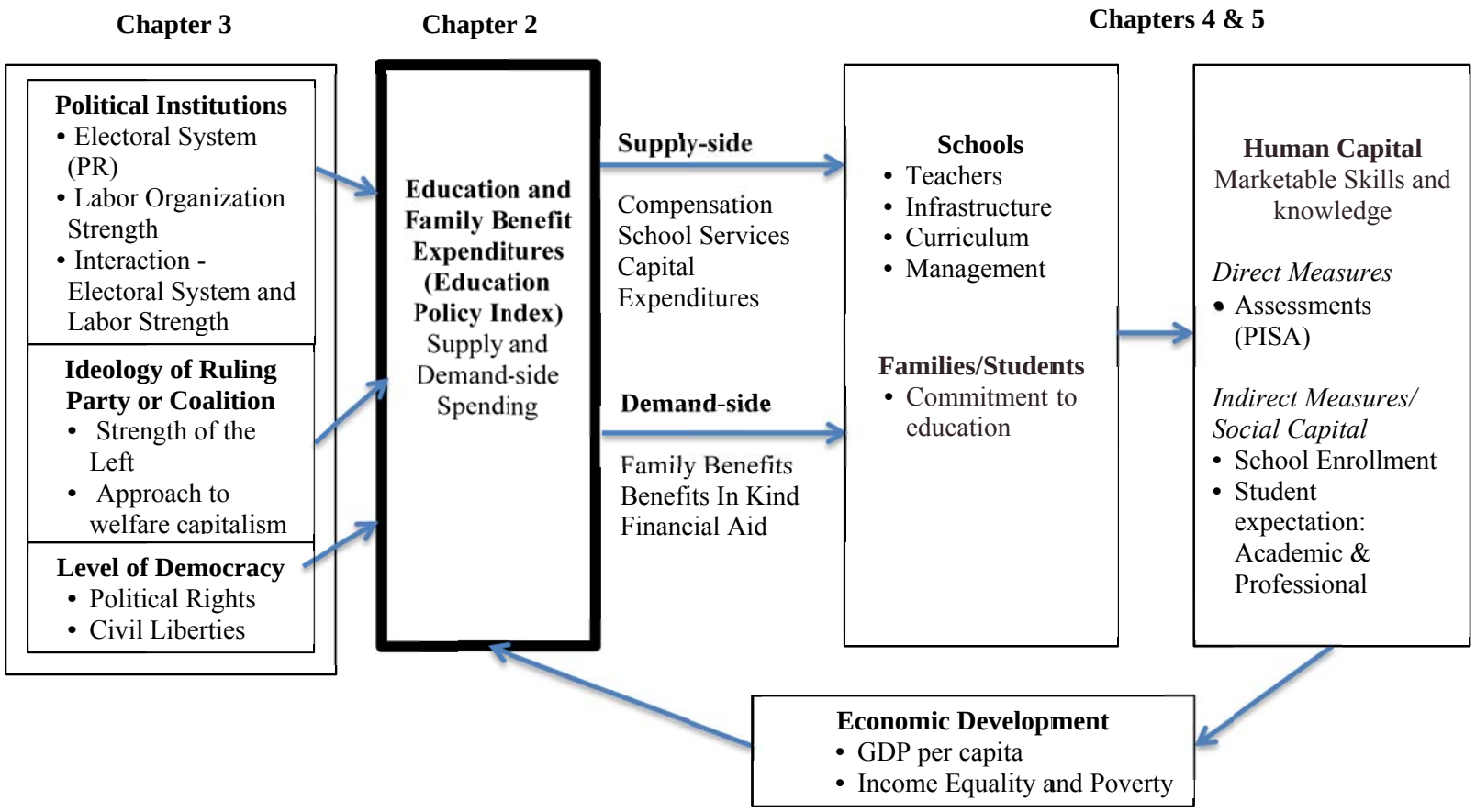
Some countries allocate funds to families of all income levels. These funds are designed to help families meet their day-to-day expenses given the added costs of supporting one or more children. Countries also allocate funds to the most disadvantaged families and these benefits are means-tested; they are determined by the family's level of

economic need. The analysis in this dissertation considers both types of expenditures to be investments in education because together these family-oriented monies act to even the playing field so all students can get to school. Cash benefits, benefits in kind, and financial aid to students are the categories of spending that satisfy the demands of families who take advantage of a country's school system; I call these "demand-side" expenditures throughout this dissertation. To reflect the two types of demand-side spending, it is either means-tested or designed for all families regardless of their income. Chapter II explains these categories in great detail, and in Chapter IV cash benefits and benefits in kind have a positive impact on gross secondary school enrollment rates. This finding implies that demand-side spending could be having a positive impact on all students' commitment to schooling.

Section 1.2. Beyond Money

In his 2009 book *The Money Myth: School Resources, Outcomes, and Equity*, W. Norton Grubb argues for a new model of schooling production that better incorporates all the factors that schools contribute to student outcomes. This new model should include school funding and resources, family background (SES), and other related policies that might impact student connectedness to schooling (Grubb 2009, 47 - Figure 1.2). This dissertation attempts to address this challenge and in Figure I-1 I present a different approach for understanding spending and family influences, and indicates which chapters address which factors.

Figure I–1. A Model for Human Capital Development and Economic Growth



The demand-side and supply-side spending discussed above make up the EPI index introduced in Chapter II. The EPI is the ratio of the supply-side spending to total education spending (supply plus demand-side spending). In the analyses presented throughout the dissertation, one of the central underlying assumptions is that the resources that schools provide, along with financial aid to families, will ultimately advance the development of human capital. This is important because research has shown that such gains can have a positive impact on a country's level of economic growth. At least one major study has claimed that raising all students' scores to a minimal level of proficiency on international exams of skills and knowledge (the PISA exam) would "imply aggregate GDP increases of close to USD 200 trillion according to historical growth relationships" (OECD 2010a, 6). Though I do not test this connection between human capital development and growth directly, the connection is recognized in the model presented in Figure I-1.

In Chapter III I explore why countries have the EPI scores they do and find that government electoral systems (specifically those elected by proportional representation, or PR systems) allocate more money to demand-side expenditures than countries that use majoritarian or mixed electoral systems. PR systems also appear to give unions more influence over how much spending will be allocated to demand-side priorities. Regardless of how they are elected, left-leaning governments play a significant role and push spending towards family benefits, both means-tested and non-means-tested, relative to school spending.

Chapter IV focuses on the impact of spending allocations on student outcomes such as enrollment rates, considered an indirect measure of human capital, and assessment scores, considered a direct indicator of human capital development. As mentioned above, demand-side expenditures in the aggregate (means tested and non-means-tested) have a positive impact on enrollment rates, which is mostly driven by the allocation of cash benefits and benefits in kind to families and students. Measures of cognitive skill and knowledge, results on PISA exams, indicate that supply-side spending (spending targeting schools and teachers) has a positive impact on student performance. Though increasing the size of the student population does not improve overall assessment scores, there is a positive correlation between student resilience on PISA scores and school spending. Thus, school investment can act as an equalizer for some of the most disadvantaged students (Downey, et al. 2004; Condron 2011).

Chapter V takes the analysis down to the individual level through surveys of graduating middle and high school students in the rural municipality of Calnali, Hidalgo, Mexico where only about 3% of the population older than 18 has a professional degree of any kind (INEGI 2010). This fine-scale study allows me to examine how government spending on education has an impact on students beyond their enrollment numbers and performance on standardized test scores. By asking those students who have benefitted from family cash benefits throughout their years of schooling about their academic and career expectations, the survey explores students' social capital gains that have the potential to develop into human capital. When students who would otherwise skip school altogether show up and participate in school events, and when they indicate that coming

to school has influenced their thinking about their futures, there is a clear connection between enrollment and expectations. Moreover, when students indicate that coming to school has a social component that they value, and students have shared expectations, an "institutionalization of group relations" is taking place, and this is at the heart of social capital formation (Portes 1998, 3). The role of social capital in influencing students' futures can be significant when going to school and pursuing advanced degrees or education-dependent professions becomes the norm.

This analysis thus allows for a more nuanced assessment of human capital development. Graduating middle and high school students already knew their academic plans when they were surveyed in the summer of 2012. While we do not know if the high school students will ever attain their education or career goals, such plans are helpful for gauging what the students think is possible, which I argue constitutes an indirect measure for the construction of human capital.[2]

Chapter VI concludes the dissertation, providing a summary of the findings and offering suggestions for future research. Foremost among the research priorities is to extend the dataset in Chapters III and IV to encompass less developed countries where more of the population is living in poverty, and where inequality is of even greater concern. Applying this approach to poorer countries could expose more of the politics behind governments' spending decisions. Moreover, an expanded study would add

[2] Chapter IV provides a discussion of the theory of human capital relative to social and cultural capital. In many ways the concepts are interrelated and social capital in particular can play a role in the development of human capital (Coleman 1988).

greater variation and provide more insight into the impacts of family and student benefits spending on both social and human capital development.

The purpose of this dissertation is to expand the definition of education spending so that it includes benefits that target families who are actively participating in the education system as well as the schools. The simultaneous funding of schools and of families who need extra fiscal support, I argue, contributes to the development of a country's human capital – both directly and indirectly. This dissertation confirms that wealth yields substantial advantages for building human capital, but it also shows that economic assistance targeted to needy families can make a major difference in improving educational outcomes for less-advantaged children.

CHAPTER II

INTRODUCING THE EDUCATION POLICY INDEX (EPI)

The bottom line: Money alone can't buy a good education system. Strong performers in PISA [The Program for International Student Assessment] *are those countries and economies that believe - and act on the belief - that all children can succeed in school … When it comes to money and education, the question isn't how much? but rather for what?*

- Guillermo Montt, *PISA in Focus,* February 2012

In Chapter I of this dissertation I introduce the importance of money in education. I also address the varying impact of a family's socioeconomic status (SES) on student outcomes in school and career, essentially showing that spending on education matters for student outcomes. In this chapter I explore *how* money matters in greater detail and introduce the Education Policy Index (EPI), a new measure that indicates a country's balance of spending on school quality versus school access.

The EPI accounts for what countries at all levels of government (national, sub-national, and local) spend on different education policies. The EPI also considers some programs funded all or in part by external sources such as the World and Inter-American Development Banks. These institutions make some expenditures possible, and may be indicative of the level of a government's commitment to the programs under discussion since such funding must be repaid.

What makes the EPI unique among measures of education spending is that it incorporates more than just school budgets. In addition to the money directed explicitly to schools, teachers, and infrastructure, the EPI captures government spending on families that enables their school-aged children to get to school and to stay there until they complete a middle school or secondary level of education (high school). By incorporating both school quality and school access spending into one measure, the EPI indicates where a country's priorities are – is it to equalize opportunities for all students, take care of wealthier students, or to balance both?

Section 2.1 of this chapter introduces the EPI and explains why it is useful for education policy analysis. **Section 2.2** of the chapter models the EPI, explains the spending policies included in its construction, and describes in detail what the index measures. **Section 2.3** of this chapter presents the EPI of 33 countries and describes how the index represents a government's spending decisions.[3] Finally, **Section 2.4** provides some preliminary analysis on what the EPI can tell us about countries' spending patterns and how this impacts students from poorer households in particular.

Analyses indicate that students from poorer backgrounds are able to do well on international reading exams when countries spend more on schools, specifically teachers and infrastructure. These preliminary findings show that the EPI could be a useful tool for evaluating spending efficiencies if a country's goal is to help the most disadvantaged achieve academically. Chapter III of this dissertation will delve into why the countries have the index score they do by examining each country's institutions, politics, and

[3] The countries in this dissertation are high middle income or high-income countries due to data availability. The EPI may prove even more useful in less developed, less wealthy countries.

economies, and Chapter IV incorporates the EPI into models examining student performance outcomes.

Section 2.1. How Does the Education Policy Index Contribute to the Literature?

Usually in studies looking at education policy and spending, the current costs of education are considered to be how much money is spent to run a school – primarily the salaries of teachers, but also auxiliary staff, learning/instructional technology, and transportation as well as operation and maintenance costs (Hanushek 1997; Holmlund, et al. 2010). The current costs are added together and divided by the number of students the schools serve to determine per-pupil spending. The overall spending per-pupil estimates are often used in research to assess school quality along with pupil-teacher ratios, teacher salary and education level, available teaching resources, and student assessment results (Lee and Barro 2001). Such spending is key to school quality because top teachers will be drawn to good salaries and can make the most of school resources. Further, well-maintained buildings and the infrastructure create an atmosphere conducive to student learning.

As discussed in Chapter I, education is tied to human capital development – students who are more educated are qualified for higher paying jobs and this in turn helps a country's economy grow. As more members of a population gain cognitive skills, more innovation is expected and this leads to new occupations and economic growth for the larger community (OECD 2010a; Romer 1990, 1986). To boost all students to a skill level that will bolster the economy requires a commitment to students,

especially those who are least likely to stay in school due to either their poor economic circumstances or a lack of commitment to their education (often due to their family's finances). Making quality schools accessible to these students is key for governments interested in helping its poorest students improve their economic prospects as well as their countries'. Education is often considered the equalizer of opportunity – giving students, regardless of their background, the chance to prove their capabilities and succeed (Downey, et al. 2004). Policies that enable poor students to get to school are therefore a critical component of education spending. Moreover, social policies that support all families economically help to create a societal environment geared toward keeping students in school since it keeps families out of economic straits.

Spending on family-oriented social policies is considered redistributive and helps alleviate poverty and ultimately reduce inequality. Recent research has shown that such policies do not just help the poor over time or make life easier for middle-class families that may be otherwise struggling. Rather, studies show that by reducing inequality within a country, the country as a whole prospers economically and that too much inequality can actually impedes a country's economic growth (Breen 1997). The impact education can have in a country when there is less inequality is significant. "Less egalitarian societies have lower average achievement, lower percentages of very highly skilled students, and higher percentages of very low-skilled students. In direct contrast, egalitarian societies have higher average achievement, higher percentages of very highly skilled students, and lower percentages of very low-skilled students" (Condron 2011, 53). Condron (2011) concludes that though causation between inequality and

achievement is not absolute, “at the very least it is quite evident that egalitarianism and educational excellence are compatible goals for affluent societies” (53).

The Education Policy Index (EPI) as presented and applied in this dissertation builds on this research and is designed to capture social spending, along with the traditional education expenditures, to better estimate the type of investments countries need to make to develop human capital. Schools alone are not the solution to the education challenges countries face in a global economy. Establishing generations of skilled thinkers requires a societal context in which education is a priority that starts within families and extends to schools and beyond. The EPI recognizes this complexity and identifies a country’s balance between providing access to education for all students, especially the country’s poorest, and providing a quality education for all students.

Section 2.2. What Does the Education Policy Index Actually Measure?

The Education Policy Index (EPI) is designed to help analysts understand a government’s overall commitment to school quality relative to school access. By dividing the spending decisions first into two broad spending categories of supply (school quality) and demand (school access), the EPI provides a lens into how committed a country is to equalizing education opportunities for its population.

The EPI score is determined by the total amount of a country’s supply-side expenditures (S) divided by a country’s total supply- and demand-side or total education expenditures. Accordingly, the more supply-oriented a country’s policies are, the closer the EPI is to one and the more demand-side oriented (D) a country’s policies are, the

closer the EPI is to zero. When a country is evenly spending between supply- and demand-side policies, its EPI score is .5.

$$\mathbf{EPI = S/(S + D)} \qquad \textit{eq. 2.1}$$

Theoretically, if governments are prioritizing equity yet still want to maintain quality schools, their EPI score should be at least a .5. This point indicates that a government is showing as much of a commitment to students (who equally need access to a quality learning environent) as to families who need varying degrees of financial support to send their children to school. This may not optimize student outcomes in terms of high test scores since more inclusion would likely bring assessment scores lower, at least at first, but it would help the country expand its base of skilled labor. Each country will have a different optimal spending point on supply and demand programs depending on the country's level of development and equity. What the EPI provides is a gauge for where resources are going and serves as an indicator of a government's policy priorities. For education analysts, the EPI can be used in models of education spending and can help address questions around equity and outcomes. For political scientists, it could prove useful in studies investigating how well politicians deliver on particular campaign promises or how spending reflects the government in charge as is presented in Chapter III.

Before discussing how the supply and demand-side policies are calculated, it is first necessary to consider which schools benefit from the spending the EPI measures

and are thus included in the index. Internationally there are three broad categories of elementary, middle, and high school institutions: public, government-dependent private, and independent private. Public schools are fully funded by the government and independent private institutions are more than 50% funded by non-government, private sources. Then there are private schools that are run independently of a public agency but are considered government-dependent because they rely on government agencies for 50% or more of their core funding and/or have their teaching personnel paid by a government agency. Spending by the government on these government-dependent private institutions is considered a public subsidy and is therefore included in education spending in the EPI calculations (Busemeyer 2007; Grubb 2009). Table II-1 profiles the 2006 enrollment of primary and secondary students by school type for countries included in this dissertation. This distinction of the schools is especially important in countries such as the Netherlands, Belgium, Chile, and Australia where over 25% of the schools are government-dependent private institutions.

Table II–1. Percent of Primary and Secondary School Students Enrolled in Different Institution Types, 2006

	Country	Public Schools	Government-Dependent Private Schools	Independent Private Schools	%Private Money funding Government-Dependent Private Schools*
1	Australia	72%	28%	0%	43%
2	Austria	92%	8%	0%	100%
3	Belgium	44%	56%	0%	6%
4	Brazil	89%	0%	11%	N/A
5	Canada	94%	0%	6%	56%
6	Chile	47%	47%	6%	18%
7	Czech Republic	94%	6%	0%	33%
8	Denmark	87%	12%	0%	19%
9	Estonia	98%	0%	2%	N/A
10	Finland	93%	7%	0%	5%
11	France	79%	21%	1%	22%
12	Germany	93%	7%	0%	12%
13	Hungary	89%	11%	0%	0%
14	Iceland	96%	4%	0%	0%
15	Ireland	99%	0%	1%	N/A
16	Israel	100%	0%	0%	18%
17	Italy	94%	0%	5%	0%
18	Japan	90%	0%	10%	N/A
19	Rep. of Korea	83%	16%	1%	36%
20	Mexico	89%	0%	11%	N/A
21	Netherlands**	30%	70%	0%	0%
22	New Zealand	82%	14%	4%	44%

Table II–1, continued

	Country	Public Schools	Government-Dependent Private Schools	Independent Private Schools	%Private Money funding Government-Dependent Private Schools*
23	Norway	96%	4%	0%	0%
24	Poland	96%	1%	4%	0%
25	Portugal	87%	4%	9%	0%
26	Slovak Republic	92%	8%	0%	23%
27	Slovenia	98%	1%	0%	32%
28	Spain	70%	25%	5%	0%
29	Sweden	92%	8%	0%	1%
30	Switzerland	94%	2%	4%	0%
31	Turkey	98%	0%	2%	N/A
32	United Kingdom	80%	15%	6%	63%
33	United States	91%	0%	9%	N/A

*The private money for government-dependent public schools is included in the total expenditures so that all spending on these schools are accounted for in the supply-side spending allocations.
**The Netherlands listed 100% of students in public schools even though about 70% of students go to government-dependent private schools and the remaining 30% are in public schools (Patrinos 2011).
SOURCE: OECD Education Database, dataset: students enrolled by type of institutions and OECD Education Database, dataset: expenditure by funding source (OECD 2012a)

The EPI looks at education spending proportionally between how much money is focusing on supply- versus demand-side policies in both public and government-dependent private schools. Supply-side policies are those that fund the quality of the primary and secondary schools once students walk through the front door. These include salaries and professional development funds for teachers and all auxiliary staff that keep a school running (administrators, support staff, teacher aides, etc.). It also includes capital expenses – school maintenance, renovation, and expansion – and transportations costs that bring students to the school.

Demand-side policies are those that help primary and secondary school students get to the front door of their school so that they can access whatever educational opportunities are available. Policies that help families meet their day-to-day expenses and parental demands are considered demand-side policies. These policies help families provide a nurturing home, nutritious food, and basic material goods to their children. The next two sections explain in greater detail the different types of spending policies and Table II-2 outlines the three supply-side categories and the three demand-side categories.

Table II–2. Supply and Demand Expenditure Categories

Supply-Side Expenditures	
Compensation of Education Personnel	Includes salaries, retirement spending, and other non-salary compensation such as healthcare for teachers as well as administrative and professional support personnel.
School Services (Support services, education materials, and ancillary services)	Support services include maintenance of school buildings, education materials include books and lab equipment, and ancillary services are services that are peripheral to the main educational mission. The two main components of ancillary services are student services (unsubsidized meals, school health services, and transportation to and from school) and services for the general public. All of these services benefit all students, regardless of their background.
Capital Expenses	Capital expenditure is expenditure on assets that last longer than one year. It includes spending on construction, renovation and major repair of buildings and expenditure on new or replacement equipment.
Demand-Side Expenditures	
Education Financial Aid	These are funds given to primary and middle school students in the form of scholarships, grants to students/households, and loans (this does not include vouchers that allow students to go to private schools)
Family-Targeted Cash Benefits (Means-tested and non-means tested)	These include family allowances (payments to families usually based on the age of a child), additional family payments stemming from a child's special needs or family situation, benefits paid to families
Family-Targeted Benefits in Kind (Means tested and non-means tested)	Miscellaneous goods and services provided to families including reductions in prices, tariffs, fares, etc.

SOURCES: For Supply-Side Expenditures: OECD 2011b "Education at a Glance", 274-275 and for Demand-Side Expenditures: Eurostat ESSPROS Manual 2008, 54-55 and OECD 2011c "Doing Better For Families," Annex 2.A3

Supply-side Policies Unpacked

Since governments vary considerably in the way they interpret spending classifications, much of the research on school expenditures looks to per pupil spending as a shortcut for understanding a country's commitment to its students. The National Center for Education Statistics (NCES) provides data on schools, students, teachers, etc., and is used extensively in education research on the United States. The NCES bases their calculation for per pupil spending on current expenditures by all government agencies – not just the Department of Education – on regular school programs, capital outlays, and interest on debt. There are seven subsections of current expenditures: 1) Instruction, 2) Administration, 3) Student and staff support, 4) Operation and maintenance, 5) Transportation, 6) Food services, and, 7) Enterprise operations (Aud, et al. 2012, 309-10). Usually these data are aggregated to account for current education expenditures for a school, district, state, or the nation as a whole. Discerning where the money actually goes and who benefits directly from the spending (teachers, staff, students, and/or suppliers) is a challenge for analyzing the impact of education spending.

In cross-national studies, spending on education usually comes from a handful of sources: The OECD's Education Database and Programme for International Student Assessment (PISA) Database, The World Bank's Databank of Education Statistics, the International Monetary Fund's Government Finance Statistics, the United Nations Educational, Scientific, Cultural Organization (UNESCO) Institute for Statistics' Education Database, and the Eurostat Education Database. The OECD's Education Database (2012a) is especially useful for researchers because it combines data from

UNESCO, the OECD, and Eurostat together and is referred to as the UNESCO/OECD/Eurostat (UOE) database. This database, the UOE, is the main driver for the categories used for the EPI's supply-side spending categories.

Supply-side policies are those that fund the quality of the primary and secondary schools so that all students who arrive at the school will benefit from these investments to some extent.[4] Attracting highly qualified teachers with good salaries, retirement and healthcare packages, and other benefits are important for guaranteeing that a school has quality professionals who will care about and educate the students. Accordingly, salaries for teachers and all auxiliary staff that keep a school running (administrators, support staff, teacher aides, etc.) is the largest and perhaps most important supply-side category. The other two categories of supply-side spending policies are non-compensation school spending and capital expenditures. Non-compensation school spending is a broad category that includes textbooks, equipment, and other school supplies, as well as building maintenance and ancillary services.

The capital expenditures are included because these reflect an investment in renovating, maintaining, or building new schools that should shorten transportation time, decrease travel expenses for school attendees (especially rural students), and avoid (or reduce) school crowding – all of which would increase school quality for students and families. Transportation to the school, if it is offered, is available to all students regardless of their SES and so it is included as a supply-side expenditure. These

[4] Within schools, there are differences in how students benefit from expenditures. Some schools offer Advanced Placement and some offer remedial support for students with special needs. At the school level these differences are worth exploring and some of these differences are addressed in Chapter V.

spending categories are intentionally broad due to the organizational differences between countries and the way they allocate funds to different types of schools. The OECD determined that these categories are the best for cross-national comparability and has data for these categories that date back to the mid-1980's.

Education data for the UOE are collected from administrators in contributing countries' Ministries of Education or National Statistical Offices, and compiled by country experts into these datasets. The data are organized into approximately ten sub databases that enable researchers to compare countries' expenditures by funding resource or transaction type, by nature and resource category, by educational personnel, etc. The expenditures by funding resource or transaction type enables researchers to see which levels of government are spending the most on education and how much comes from private or international sources. Navigating the data to assure an accurate representation of government spending has its own set of challenges since all of these categories have been interpreted by each country; some categories are left blank in one database because the spending is accounted for in another and these are often not cross-referenced. Using the OECD's comprehensive Education Database as a guide, then, the categories for tracking school quality are kept broad as shown in Table II-2 and discussed above. The advantage of broadly aggregating spending is that expenditures are less likely to be omitted, but the disadvantage is that the detail as to how the money is being spent gets lost. This is especially true around curriculum spending which is part of the "non-compensation spending" category so it is not clear how the money is going to improve the classroom resources, equipment, or facilities. Yet, given that the non-

compensation spending category includes all of these, it is possible to get some idea of how prioritized this aspect of spending is relative to all the other investments.

Demand-Side Spending Unpacked

In all countries, a student's SES has a significant impact on learning outcomes, and wealthier students have clear academic advantages that often translate into professional and economic benefits (OECD 2010b). As discussed earlier, research has shown that reducing inequality lends itself to a better economic outcome for individuals and countries in general. Nations that want to make sure all its citizens have a basic level of education, and that seek to equalize opportunities so that capable and motivated students, regardless of their background, have a chance to prove themselves, will invest in families and make it easy for students to access a good school. Social welfare spending, especially spending targeting poorer students and their families, should therefore be considered part of a country's total education spending. Since these are the investments that drive the demand for schools, this spending is considered demand-side spending.

The OECD Social Expenditure Database (SOCX) compiles five types of family-directed benefits (OECD 2012b). Three are cash benefits: 1) family allowances or payments for children, 2) maternity and paternity leave, and 3) other cash benefits such as sole parenting benefits or monies from conditional cash transfer (CCT) programs.[5]

[5] Conditional Cash Transfers and their impact on students are discussed in detail in Chapter V. These types of cash benefits are paid to poor families in countries with high poverty rates such as Mexico, Chile,

Each of these benefits gives parents at all income levels extra financial support that, for the poorest families, can amount to a significant subsidy. In Latin America "cash transfers and other public welfare transfers represent an average of 10.3% of the per capita income of recipient households" (Cecchini and Madariaga 2011, 118). The other two family benefits are types of benefits-in-kind and these take the form of 1) day care/home help services, or 2) kindergarten or other child-oriented program. Studies have shown that these benefits have a significant impact on reducing child poverty for the poorest families (Förster and Verbist 2012).

The OECD Education Database also provides data on government financial aid to students in primary or secondary school. This spending comprises of student loans as well as "government scholarships and other government grants to students or households. These include, in addition to scholarships and similar grants (fellowships, awards, bursaries, etc.), the following items: the value of special subsidies provided to students, either in cash or in kind, such as free or reduced-price travel on public transport systems; and family allowances or child allowances that are contingent on student status" (OECD Education Dataset: Expenditure by Funding Source and Transaction Type). Some countries include CCTs in this "financial aid" category (e.g., Turkey) whereas other countries include CCTs in the family cash benefits category (e.g., Mexico), so both are necessary to assure more accurate spending estimates.[6]

Brazil, and Turkey. Payments are based on family need and are conditional on activities such as parents taking students to a set number of medical check-ups and students attending school 80% of the time.

[6] Each country's data was carefully reviewed to assure that spending allocations for cash benefits and financial aid were not duplicated when calculating country EPI scores.

Social welfare spending directed to families in the form of financial aid, cash benefits, or benefits-in-kind varies considerably across countries; some of the benefits are means-tested and some are not. In developing countries, cash benefits that reward families financially for sending their children to school are particularly helpful since the income working children can generate is often critical for an impoverished family to provide food and shelter. Cash benefits in the form of CCTs have had a positive impact on school enrollment rates by incentivizing families to send their students to school instead of having them work during the day; students may still work after school but at least they are now also spending time in the classroom (Attanasio, et al. 2011; Coady and Parker 2004; Ravallion and Wodon 2000). Additional cash also helps alleviate some of the expense of sending a child to school (uniforms and supplies still cost families money even if there are no tuition fees). Benefits-in-kind, such as government assistance with paying for home help, are also important for families who may require at-home care for elderly family members or infants; middle- and high-school aged children are sometimes kept home to help care for these family members while the income-earning adults are at work (de Janvry, et al. 2006). Countries at all levels of development that offer care for the very young or the elderly are therefore providing families with additional support they need to keep sending their children to school.

Some of the broader family policies, such as child care facilities or maternity leave, benefit all families regardless of their wealth while other programs, such as lunch subsidies or means-tested home help benefits, are directed only to poor families. Government expenditures that benefit all families regardless of their income may help

the poor significantly, but it is not clear that such spending is critical for financially stable families to keep their children in school, especially in wealthier countries where truancy laws are enforced. To capture these distinctions, there are two types of family investments that qualify as demand-side spending in this research. The first type of spending includes social welfare programs designed for all families regardless of income (EPI-A), and the other is means-tested, or targeted to the neediest families (EPI-M).

The EPI-A measure represents a universal policy approach and is constructed using all governmental spending on families (family cash benefits and benefits in kind, as well as government sponsored financial aid). Castles (2009) shows that "cross-national differences in poverty and inequality among advanced nations are to a very large degree a function of the extent of cash spending on programs catering to the welfare needs of those of working age" (45). Welfare spending in Castles' research is spending geared to families regardless of their needs and he shows that such investments help reduce inequality (as measured by the country's GINI coefficient, a measure of a society's inequality), and poverty. Different types of welfare spending, however, impact different segments of a population. In his seminal book *The Three Worlds of Welfare Capitalism*, Esping-Andersen (1990) shows that some types of social spending helps the wealthy rather than the poor, some helps working families more, and some does help the poor even though means-tested spending is "mean to everyone" meaning it keeps the poor poor relative to the rest of the society (Castles 2009, 46). To assess how well the poor specifically are being supported by social welfare policies, the EPI-M includes only those programs that are means-tested and target poor families, or those families that

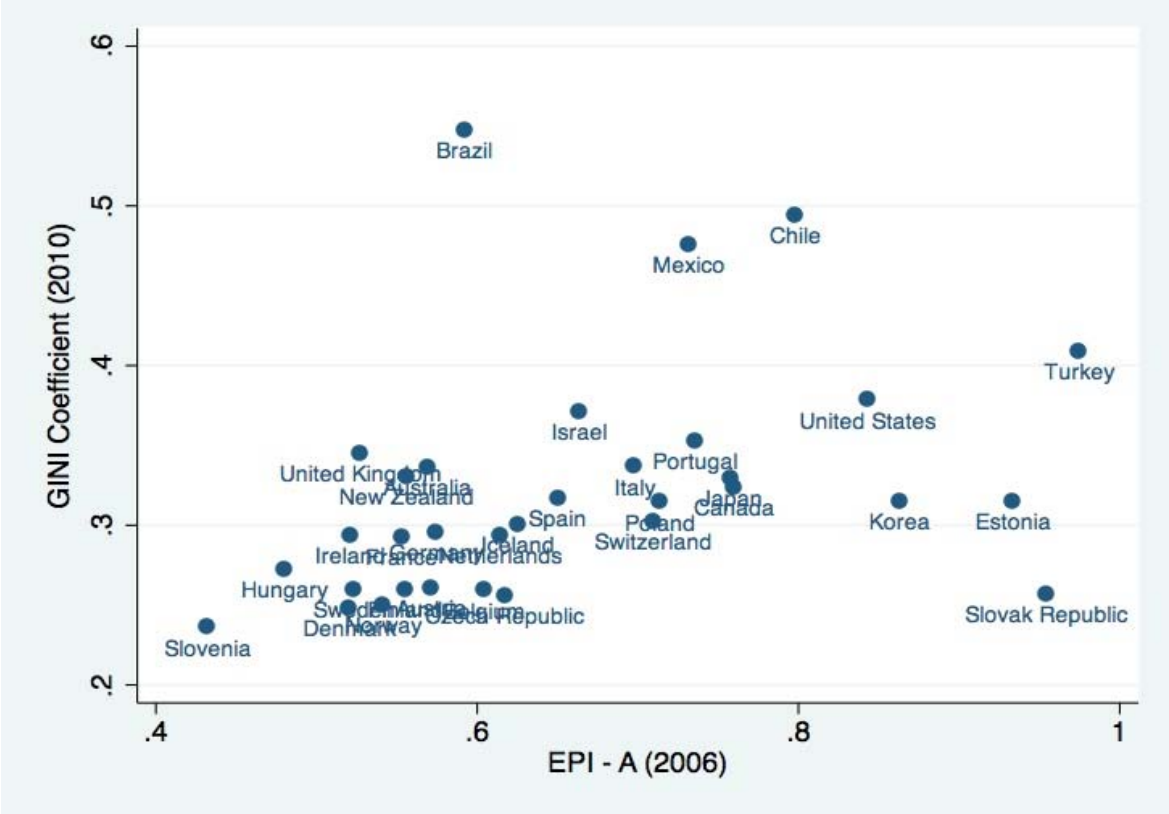
might consider not sending their students to school because of their impoverished living conditions. Both EPI measures are tested throughout this dissertation and a list of programs incorporated in each type of EPI for the countries analyzed are listed in Appendix A.

Section 2.3. Country EPI Scores Unpacked

Countries that are more supply-side focused are those that spend more on schools and infrastructure relative to what they spend on families' social welfare. Given a country's GINI coefficient, this may (or may not) imply that there is a lack of focus on helping families gain access to quality education. Rudra (2004) shows that in wealthier countries, broad social investments (i.e., education, health, and social security and welfare) are able to reduce inequality whereas only spending on education has a significant impact on poverty in less developed countries. Figure II-1 shows the relationship between the EPI-A (2006) and the 2010 GINI coefficient for the countries included in this dissertation. These are significantly and positively correlated ($p=.04$) and shows simply that the countries in this dataset that spend more on supply relative to demand have higher inequality.[7] The level of a country's wealth in all regression analyses show that wealthier countries in the dataset have a slightly lower GINI coefficient but this is due to the large number of European democracies included in the sample.

[7] There is not a causal relationship between the balance of supply-side and demand-side spending in 2006 for countries in this dataset and the countries' 2010 GINI coefficient.

Figure II–1. EPI-A and GINI Coefficient



Tables II-3 and II-4 show the 33 countries that are included in the analyses throughout Chapters II, III and IV of this dissertation. The countries' EPI-A and EPI-M scores for 2006 are presented along with a breakdown of the EPI's spending categories. There is some variation in the EPI-M scores but overall they are highly skewed to the supply-side range of the index because so many countries included in this analysis are wealthy and target their benefits to the broader population. The demand- and supply-side spending percentages represent the percent of total EPI-A or EPI-M spending that is allocated to each category. In Chapter III the political and economic reasons for these country's EPI-A and EPI-M scores will be examined in greater detail.

Table II–3. Country EPI-A Scores, 2006

			% Supply Spending, EPI-A			% Demand Spending, EPI-A*		
Country	**EPI-A, 2006**	**% of EPI-A Benefits are Means-tested**	**Compensation**	**School Services**	**Capital expenditures**	**Cash Benefits**	**Benefits in Kind**	**Financial Aid**
Australia	0.57	19%	40%	11%	6%	32%	10%	2%
Austria	0.57	4%	43%	13%	2%	35%	7%	0%
Belgium	0.60	4%	52%	7%	2%	24%	14%	1%
Brazil	0.59	100%	41%	15%	3%	6%	35%	0%
Canada	0.76	16%	56%	16%	4%	21%	3%	0%
Chile	0.80	23%	80%			11%	9%	0%
Czech Republic	0.62	33%	35%	22%	6%	24%	12%	3%
Denmark	0.52	13%	38%	11%	3%	18%	24%	6%
Estonia	0.93	69%	93%			3%	1%	3%
Finland	0.56	7%	33%	17%	5%	23%	20%	2%
France	0.55	25%	41%	10%	5%	20%	24%	2%
Germany	0.57	14%	45%	8%	4%	24%	17%	2%
Hungary	0.48	6%	48%			32%	18%	2%
Iceland	0.63	28%	44%	12%	7%	14%	22%	1%
Ireland	0.52	11%	39%	8%	5%	36%	9%	3%
Israel	0.66	14%	47%	15%	4%	16%	17%	1%
Italy	0.70	32%	56%	11%	3%	13%	16%	1%
Japan	0.76	38%	60%	8%	7%	12%	12%	0%
Korea	0.86	17%	56%	21%	9%	0%	12%	1%
Mexico	0.73	55%	66%	5%	2%	7%	15%	4%
Netherlands	0.61	12%	44%	9%	9%	11%	23%	5%

Table II-3, continued

Country	EPI-A, 2006	% of EPI-A Benefits are Means-tested	% Supply Spending, EPI-A			% Demand Spending, EPI-A*		
			Compensation	School Services	Capital expenditures	Cash Benefits	Benefits in Kind	Financial Aid
New Zealand	0.56	53%	56%			32%	10%	3%
Norway	0.54	25%	37%	10%	7%	21%	20%	5%
Poland	0.71	22%	58%	7%	6%	20%	7%	2%
Portugal	0.74	42%	68%	4%	1%	16%	9%	1%
Slovak Republic	0.95	53%	62%	29%	4%	2%	0%	2%
Slovenia	0.43	66%	31%	8%	4%	14%	6%	37%
Spain	0.65	32%	48%	11%	6%	13%	20%	1%
Sweden	0.52	13%	34%	14%	4%	20%	24%	3%
Switzerland	0.71	18%	55%	10%	6%	21%	7%	1%
Turkey	0.97	85%	79%	12%	6%	2%	0%	2%
UK	0.53	15%	37%	10%	5%	31%	16%	1%
USA	0.84	94%	60%	15%	10%	3%	13%	0%

***** For some countries, even if the country allocates some monies to a supply-side category, it appears as 0% due to rounding. For example, Korea does spend some money on Cash Benefits for families, but it is a significantly small amount relative to the spending allocated to the other categories.
SOURCES: OECD SOCX Database (2012b) and OECD Education Database (2012a). In addition, the following sources are used:
a) For Brazil: Data for the Conditional Cash Transfer program, *Bolsa Familia*, as well as social assistance spending (the Social Assistance Reference Centres or CRAS and the Comprehensive Famiy Care Programme or PAIF) were available from Soares 2012, Soares et al. 2010, and Lindert et al. 2007. Social assistance estimates are calculated as 1.4% GDP (2005) or US$1.7 trillion.
b) For Chile: Guardia et al. 2011, Fiszbein and Schady 2009, and OECD 2011d
c) For Turkey: Sources confirming OECD financial aid spending (the country's spending on its Conditional Cash Transfer program) include: Şener 2012 and Rawlings and Rubio 2005, 35 (Table 2)

Table II–4. Country EPI-M Scores, 2006

Country	EPI-A 2006	EPI-M, 2006	% Supply Spending (EPI-M)			% Demand Spending, EPI-M*		
			Compensation	School Services	Capital expenditures	Cash Benefits	Benefits in Kind	Financial Aid
Australia	0.57	0.87	62%	17%	9%	0%	10%	3%
Austria	0.57	0.97	72%	22%	3%	0%	2%	1%
Belgium	0.60	0.98	84%	11%	3%	0%	0%	2%
Brazil	0.59	0.59	41%	15%	3%	6%	35%	0%
Canada	0.76	0.94	69%	20%	5%	0	6%	0
Chile	0.80	0.94	94%			5%	0%	1%
Czech Republic	0.62	0.83	46%	29%	7%	14%	0	3%
Denmark	0.52	0.89	65%	19%	6%	0%	0	10%
Estonia	0.93	0.95	95%			1%	0	3%
Finland	0.56	0.95	57%	29%	9%	1%	1%	3%
France	0.55	0.83	62%	14%	7%	1%	12%	3%
Germany	0.57	0.91	71%	13%	6%	5%	0%	4%
Hungary	0.48	0.94	93%			2%	0%	4%
Iceland	0.63	0.86	60%	16%	10%	9%	4%	1%
Ireland	0.52	0.91	68%	14%	9%	4%	0	5%
Israel	0.66	0.93	67%	21%	6%	1%	5%	1%
Italy	0.70	0.88	70%	14%	4%	9%	2%	1%
Japan	0.76	0.89	71%	10%	8%	0	11%	0%
Korea	0.86	0.97	64%	23%	10%	0	1%	1%
Mexico	0.73	0.83	75%	6%	2%	8%	4%	5%
Netherlands	0.61	0.93	66%	14%	13%	0	0	7%

Table II-4, continued

Country	EPI-A 2006	EPI-M, 2006	% Supply Spending (EPI-M)			% Demand Spending, EPI-M*		
			Compensation	School Services	Capital expenditures	Cash Benefits	Benefits in Kind	Financial Aid
New Zealand	0.56	0.70	70%			18%	8%	4%
Norway	0.54	0.83	57%	15%	10%	0	10%	7%
Poland	0.71	0.92	74%	9%	8%	6%	0	2%
Portugal	0.74	0.87	81%	5%	1%	10%	2%	1%
Slovak Republic	0.95	0.98	63%	30%	4%	0%	0%	2%
Slovenia	0.43	0.54	39%	10%	5%	0%	0%	46%
Spain	0.65	0.85	63%	14%	8%	4%	8%	2%
Sweden	0.52	0.90	59%	24%	6%	0%	5%	6%
Switzerland	0.71	0.93	72%	13%	8%	1%	5%	1%
Turkey	0.97	0.98	80%	12%	6%	0%	0%	2%
UK	0.53	0.88	62%	17%	9%	0%	10%	2%
USA	0.84	0.85	61%	15%	10%	3%	12%	0

***** For some countries, even if the country allocates some monies to a supply-side category, it appears as 0% due to rounding. For example, Korea does spend some money on Cash Benefits for families, but it is a significantly small amount relative to the spending allocated to the other categories.
SOURCES: OECD Education Database (OECD 2012a) and OECD SOCX Database (OECD 2012b). In addition, the following sources are used:
a) For Brazil: Data for the Conditional Cash Transfer program, *Bolsa Familia*, as well as social assistance spending (the Social Assistance Reference Centres or CRAS and the Comprehensive Famiy Care Programme or PAIF) were available from Soares 2012, Soares et al. 2010, and Lindert et al. 2007. Social assistance estimates are calculated as 1.4% GDP (2005) or US$1.7 trillion.
b) For Chile: Guardia et al. 2011, Fiszbein and Schady 2009, and OECD 2011d
c) For Turkey: Sources confirming OECD financial aid spending (the country's spending on its Conditional Cash Transfer program) include: Şener 2012 and Rawlings and Rubio 2005, 35 (Table 2)

The countries presented in Tables II-3 and II-4 were selected because they participated in the 2009 PISA exams and because their spending data are available in the UNESCO/OECD /Eurostat (UOE) and OECD Social Expenditures (SOCX) databases. Furthermore, there is a strong literature about these country's education systems on which this study can build. For three countries, though, data beyond the databases have been needed. Brazil, Chile, and Turkey are upper middle income countries according to the World Bank and additional budget information had to be added to reflect the impact of conditional cash transfer programs and other spending initiatives not accounted for in the databases. These countries receive international monies to help their social and education programs and accounting for their expenditures is consequently more complicated.

Most of the countries in the sample (20) are considered high income and the remaining 13 countries are considered upper-middle income countries.[8] Table II-5 shows the GDP and GNI per capita for each participating country as well as the per-pupil spending estimates based on supply-side spending (the traditional per pupil estimates), EPI-A spending, and EPI-M spending.

[8] "High income for nonOECD" is defined by the World Bank (World Development Indicators, 2009) as having a 2006 GDP per capita greater than $21,009 or a 2006 GNI per capita greater than $30,846.

Table II–5. GDP and GNI Per Capita (2006) and Per-Pupil Spending for Primary and Secondary Public and Government-Dependent Private Schools, 2006

Country	GDP per capita (2006)	GNI per capita (2006)	Spending Per Pupil (2006)		
			Supply-Side Only	EPI-A	EPI-M
Norway*	$72,960	$53,330	$14,562	$26,885	$17,637
Iceland	$54,814	$33,780	$13,023	$20,822	$15,181
Switzerland	$54,140	$42,510	$12,167	$17,142	$13,073
Ireland	$52,501	$37,270	$9,318	$17,885	$10,288
Denmark	$50,462	$36,700	$13,310	$25,563	$14,912
United States	$44,623	$45,640	$10,540	$12,499	$12,374
Sweden	$43,949	$36,140	$9,677	$18,487	$10,810
Netherlands	$41,459	$39,070	$8,440	$13,738	$9,072
United Kingdom	$40,481	$35,150	$8,992	$17,040	$10,232
Finland	$39,487	$33,430	$8,617	$15,514	$9,085
Austria	$39,300	$36,110	$10,389	$18,179	$10,701
Canada	$39,250	$36,410	$8,600	$11,314	$9,140
Belgium	$37,919	$34,490	$8,313	$13,755	$8,518
Australia	$35,986	$33,010	$6,512	$11,446	$7,451
France	$35,457	$31,950	$8,727	$15,786	$10,473
Germany	$35,238	$34,210	$6,422	$11,177	$7,096
Japan	$34,102	$32,770	$8,224	$10,846	$9,214
Italy	$31,777	$30,170	$8,865	$12,700	$10,090
Spain	$28,025	$29,810	$5,257	$8,086	$6,153
New Zealand	$26,173	$25,230	$5,184	$9,324	$7,392
Israel	$20,625	$24,840	$4,393	$6,621	$4,708
Korea, Rep.	$19,676	$24,320	$4,851	$5,621	$4,983
Slovenia	$19,406	$25,140	$5,704	$13,190	$10,632

Table II-5, continued

Country	GDP per capita (2006)	GNI per capita (2006)	Spending Per Pupil (2006)		
			Supply-Side Only	Country	GDP per capita (2006)
Portugal	$19,065	$22,180	$5,189	$7,052	$5,967
Czech Republic	$14,446	$21,230	$2,890	$4,683	$3,484
Slovak Republic	$12,799	$17,800	$1,723	$1,805	$1,766
Estonia	$12,503	$18,150	$2,659	$2,848	$2,790
Hungary	$11,174	$17,300	$2,567	$5,344	$2,739
Chile	$9,376	$11,380	$1,182	$1,481	$1,252
Poland	$8,958	$14,680	$1,689	$2,366	$1,838
Mexico	$8,831	$13,070	$1,356	$1,853	$1,628
Turkey	$7,687	$12,790	$754	$773	$770
Brazil	$5,793	$8,810	$940	$1,587	$1,587

*Countries are listed in order of wealth based on GDP per capita (2006).
SOURCES: World Bank's World DataBank World Development Indicators (WDI) and calculations based on EPI spending allocations. Enrollment numbers are based on those used in Table 1 from the OECD Education Database, dataset: students enrolled by type of institutions.

The traditional per pupil estimates do not include demand-side cash benefits or benefits in-kind though they may include financial aid; for primary and secondary school students, however, financial aid is minimal.[9] The cash benefits that would be included in some country's educational spending stem from conditional cash transfer programs that have become popular in developing countries. Mexico, Chile, Turkey, and Brazil each have a form of this program that essentially pays families to send their students to school. In Chapter III these countries' decisions to pursue these programs will be detailed but it is worth noting here that these spending decisions are mostly due to the

[9] Data for spending per pupil is often separated by school level because upper secondary school spending per pupil is greater than lower secondary school spending per pupil that is in turn greater than primary school spending per pupil. Since overall education expenditures are being evaluated in this analysis for students through the secondary school level, this spending is aggregated. Future analysis could look at spending disaggregated by school level.

priority poverty reduction is for the party in power and the level of poverty each country is trying to alleviate.

Section 2.4. Using the EPI as a Spending Indicator

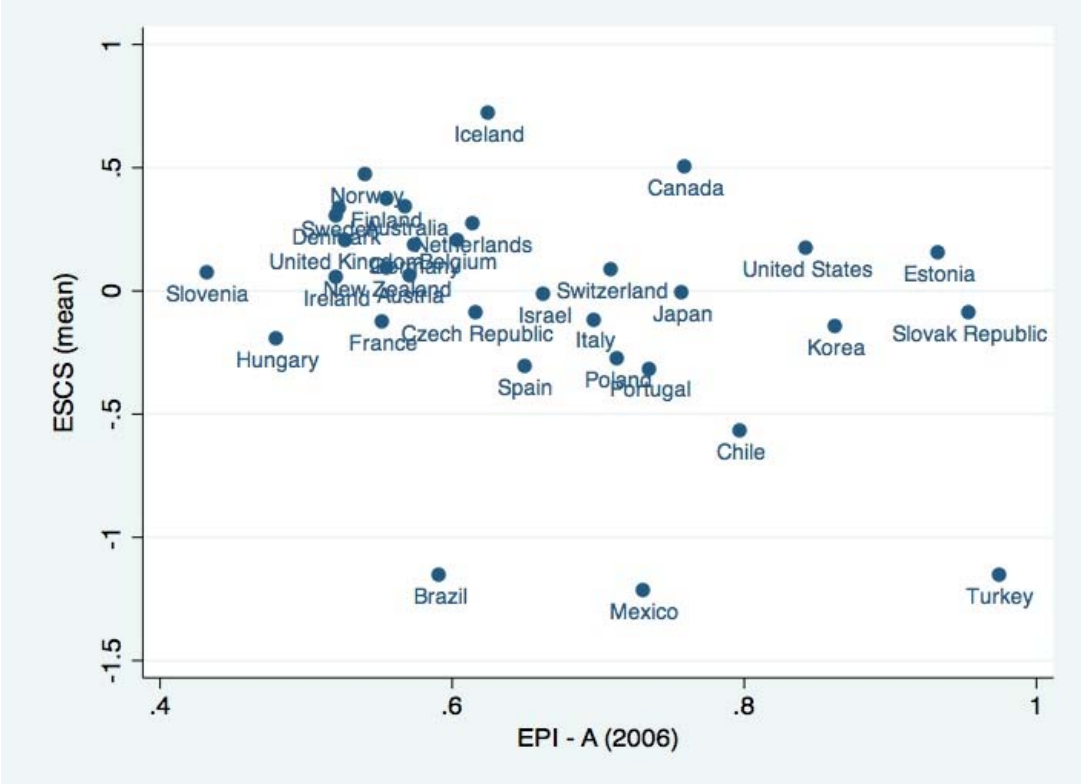
The Program for International Student Assessment (PISA) has developed an index for capturing the socio-economic status (SES) of students taking the PISA exams. The PISA Index of Economic, Social, and Cultural Status (ESCS) is a "comprehensive measure of student socio-economic background. This index was derived from information comprising the highest educational level of parents, the highest occupational status of parents, and possessions in the home" (OECD 2009a). Each country has a mean ESCS score that shows the average SES of the students who took the 2009 PISA exam relative to the average OECD student's SES; the mean ESCS for each country used in this dissertation is listed in Table II-6. The PISA coordinators make it a point to test a representative group of students from each participating country's population and the ESCS scores reflect the GDP per capita very closely.

Table II–6. Average Economic, Social, and Cultural Status (ESCS) Index Mean by Country, 2006

Country	ESCS Mean
Australia	0.34
Austria	0.06
Belgium	0.2
Brazil	-1.16
Canada	0.5
Chile	-0.57
Czech Republic	-0.09
Denmark	0.3
Estonia	0.15
Finland	0.37
France	-0.13
Germany	0.18
Hungary	-0.2
Iceland	0.72
Ireland	0.05
Israel	-0.02
Italy	-0.12
Japan	-0.01
Korea	-0.15
Mexico	-1.22
Netherlands	0.27
New Zealand	0.09
Norway	0.47
Poland	-0.28
Portugal	-0.32
Slovak Republic	-0.09
Slovenia	0.07
Spain	-0.31
Sweden	0.33
Switzerland	0.08
Turkey	-1.16
United Kingdom	0.2
United States	0.17

To examine more closely how school and family spending impact a population of students, the EPI-A can quickly show how countries with poorer (or wealthier) students are spending their resources. Figure II-2 is a scatterplot that shows the 2006 EPI-A score of each country relative to the mean 2009 ESCS index score of the students in each country.[10]

Figure II–2. EPI-A Scores and Mean Student ESCS Scores by Country



Pairwise Correlation is negative and significant (p<.05)
SOURCE: 2009 PISA

[10] A three year lag is used throughout this dissertation between government expenditures (2006) and student outcomes such as assessment results and resilience scores (2009). The lag is to account for the time it takes for spending to have an impact on students. In all but a handful of countries there is not a great deal of variance in spending between 2006 and 2009. Those countries that have significant expenditure variation will be discussed in more detail in Chapter III.

The pairwise correlation between the EPI-A and the ESCS is negative and significant ($p<.05$), and the pairwise correlation between the EPI-M and the ESCS is insignificant, indicating then when only means-tested demand-side spending is considered, there is no relationship between the average wealth of the students and the balance of supply- and demand-side spending. The EPI-A result indicates that when a country's average student is poorer relative to the average OECD student, the country spends more proportionally on school quality than on school access. The correlation also implies that when students are wealthier (come from wealthier countries) they spend more on demand-side or access policies. This may reflect the influence of the European country's relatively generous social polices.

What would be interesting to explore is what the ESCS is of each country's school-aged population (not just those taking the PISA exam) and to see if more poor students are making their way into the school system given the country's EPI-A score. If a country is investing in demand-side policies and there are more poor students in school, especially in countries where truancy laws are not strongly enforced, this would indicate that the demand-side spending is achieving its goal of getting students to school.

The increased spending on schools when the students are less wealthy may be reflecting an increased commitment to the students who are already there or to programs designated for struggling students. One approach to further understand spending relative to student wealth is to unpack the EPI-A.

$$EPIA_c = \beta_0 + ESCS_c\beta_1 + \varepsilon \qquad \textit{eq. 2.2a}$$
$$EPIM_c = \beta_0 + ESCS_c\beta_1 + \varepsilon \qquad \textit{eq. 2.2b}$$

In the model above, $EPIA_c$ and $EPIM_c$ represents the six different EPI categories for each country, and $ESCS_c$ is the mean ESCS score for each country.[11] The GDP per capita for each country is not used in the analysis because the ESCS scores already capture the general wealth of the country.[12] Results are shown in Table II-7 and show that in the 33 countries studied, when the average student is wealthier, spending on teacher compensation is proportionately less than spending on the other education categories, and proportionately more is spent on cash benefits; accordingly, when students are not as wealthy, countries are spending proportionately more on teacher compensation and less on cash benefits. When only means-tested demand-side policies are included in the analysis, the two spending categories of significance are school services and capital expenditures – as the average family wealth of the students increase, so do investments in these areas. The results indicate that when demand-side spending targets only poorer students and their families, and when the average student in a country comes from a less wealthy family, proportionately less money is actually going to the school and infrastructure.

[11] In Equation 2.2a, $EPIA_c$ represents the six categories of the EPI based on total demand- and supply-side spending estimates: the percent teacher compensation - A, percent school services-A, percent capital expenses-A, percent cash benefits-A, percent benefits in kind-A, and percent financial aid-A. In Equation 2.2b, the $EPIM_c$ represents the six categories based on total means-tested demand-side spending only plus supply-side spending estimates: the percent teacher compensation - M, percent school services-M, percent capital expenses-M, percent cash benefits-M, percent benefits in kind-M, and percent financial aid-M.
[12] Because they did not disaggregate their spending data in the OECD database, Chile, Hungary, New Zealand, and the Slovak Republic are excluded in this analysis so N=29.

Table II-7. Relationship Between Student Wealth and Expenditures

Dependent Variables	Correlation of percent $EPIA_c$ categories with Mean ESCS	Correlation of percent $EPIM_c$ categories with Mean ESCS
Supply-Side Spending		
Percent Teacher Compensation	-.134 *** (.04)	-.003 (.04)
Percent School Services	.010 (.02)	.054* (.02)
Percent Capital Expenditures	.011 (.01)	.03** (.01)
Demand-Side Spending		
Percent Cash Benefits	.095** (.04)	-.021 (.02)
Percent Benefits in Kind	.005 (.03)	-.035 (.03)
Percent Financial Aid	.009 (.03)	.017 (.03)

N=29, *p<.05, **p<.01, ***p=.01
NOTES: Standard errors in parentheses

Since most of the wealthier countries in this analysis have generous social spending policies, this drives the results for the proportionately higher cash benefit spending. The higher percentage of money going to teacher compensation when the average wealth of students is lower could reflect a stronger commitment to the most needy students. Such spending could reflect the hiring of more teachers, an increase in teacher pay, or both, and any of these options could help students, so long as they were getting to school in the first place. With a lower percentage of education monies going to cash benefits, though, this may not be the case. Indeed, since we know the proportion of spending on teachers is higher than the proportion of cash benefit allocations when the

average student is less wealthy, it is more likely that poorer students are not benefitting. This suggests that money going to the schools is helping the students already there rather than helping the students in need when the students come from families with income below the OECD average.

If this is true, then are students who come from less wealthy families, benefitting from school spending? Based on the 2009 PISA exam results in reading, the OECD was able to determine how resilient students are in each country taking the exam. "A student is classified as resilient if he or she is in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in the country of assessment and performs in the top quarter across students [in reading] from all countries after accounting for socio-economic background" (OECD 2010b, 63). Table II-8 shows the resilience of students from each country on the reading exam, listing the most resilient countries first. Korea, Finland, Japan, and Turkey, in that order, have the most resilient students.

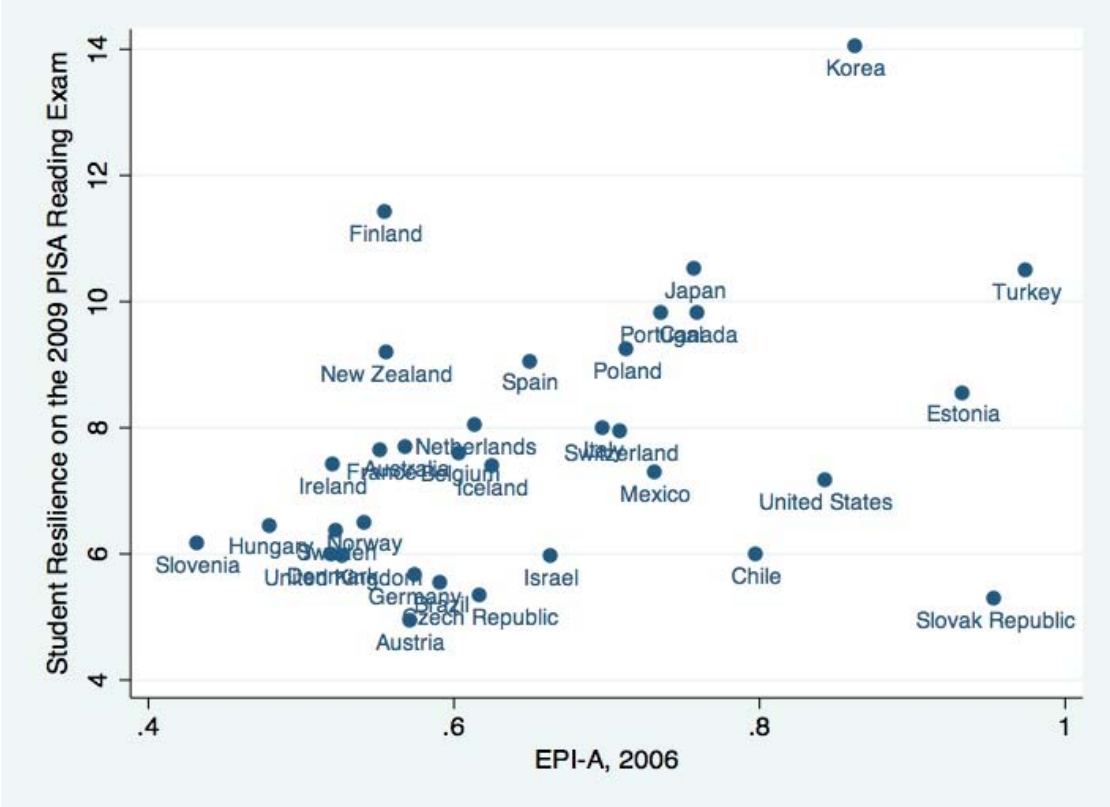
Table II–6. Student Resilience on the 2009 PISA Exams

Country	% Resilient students from the country's poorest
Korea	56%
Finland	46%
Japan	42%
Turkey	42%
Canada	39%
Portugal	39%
Poland	37%
New Zealand	37%
Spain	36%
Estonia	34%
Netherlands	32%
Italy	32%
Switzerland	32%
Australia	31%
France	30%
Belgium	30%
Ireland	30%
Iceland	29%
Mexico	29%
United States	29%
Norway	26%
Hungary	26%
Sweden	25%
Slovenia	25%
Chile	24%
Denmark	24%
Israel	24%
United Kingdom	24%
Germany	23%
Brazil	22%
Czech Republic	21%
Slovak Republic	21%
Austria	20%

SOURCE: PISA 2009 Database (OECD 2010c)

To begin to understand the role spending has had on student resilience, Figure II-3 shows the EPI-A score of each country and the resilience of the students in that country. A simple correlation between the EPI-A and student resilience is positive and significant (p=.03) indicating that as countries invest proportionally more in schools, they are improving the scores of at least some of the neediest students in reading.

Figure II–3. EPI-A Scores and Student Resilience



NOTE: Percent of Resilient Students are the percent of students from the bottom quartile on the PISA Economic, Social, and Cultural Status (ECSC) index who were top performers on the 2009 PISA Reading exam.
SOURCE: Education at a Glance 2011a (OECD)

Given these results, school spending does appear to be helping the poor students rather than just the wealthy students who are already at school. Even if countries are spending less on family cash benefits, when the students do get to the school, it appears that they are making some gains thanks to the supply-side investments countries are making.

Section 2.5. Conclusion

The all-encompassing Education Policy Index (EPI-A) has been carefully constructed to include all the spending countries designate for public and government-dependent private schools, as well as to families. Since the EPI-M only considers means-tested programs, rather than more broadly oriented family programs, it could prove more useful for analyzing less-developed countries or countries that have more means-tested programs.

In addition to the overall EPI-A and EPI-M country scores, it is useful to know the proportion of spending going to each of the six EPI categories in the same year. The breakdown of each category makes it possible to analyze the broader, relative impacts of spending allocation decisions. Policies do not happen in isolation and this breakdown gives analysts the chance to consider what is simultaneously happening programmatically for students at home and at school. For example, we saw that proportionately more monies are going to compensate teachers than to giving families cash benefits when countries have less wealthy students and that, based on student resilience on the 2009 PISA reading exam, this spending appears to have a positive

impact on student outcomes. This strongly implies that spending on schools does make a difference for students – money matters.

The utility of the country-level EPI-A and EPI-M scores will be explored throughout the dissertation. EPI scores at state or regional levels, or even across schools and districts, could also be conceived given the right dataset. When analyzing how spending impacts individual students going to the same school, the EPI would not be appropriate as there is no variation in the supply-side spending unless data are available for spending allocations to different classrooms. In Chapter V of this dissertation, how the benefits of particular social policies impact students from the same school is addressed.

CHAPTER III

WHAT DO COUNTRY POLITICS TELL US ABOUT EDUCATION POLICY INDEX SCORES?

Chapter II introduced the Education Policy Index (EPI) and the supply- and demand-side spending that determines countries' EPI-A and EPI-M scores. This chapter explores countries' political and economic conditions and evaluates how they impact governments' education and family-oriented policy and spending decisions. Wealthier countries spend more on education overall as well as proportionally than less developed countries (LDCs), with the United States being one of the few and notable exceptions. Gross Domestic Product per capita (GDPpc) explains 16% of overall spending on education and family-benefit policies, 15% of supply-side or education spending policies, and 27% of all demand-side or family benefit policies; means-tested demand-side policies are not explained by a country's wealth.[13]

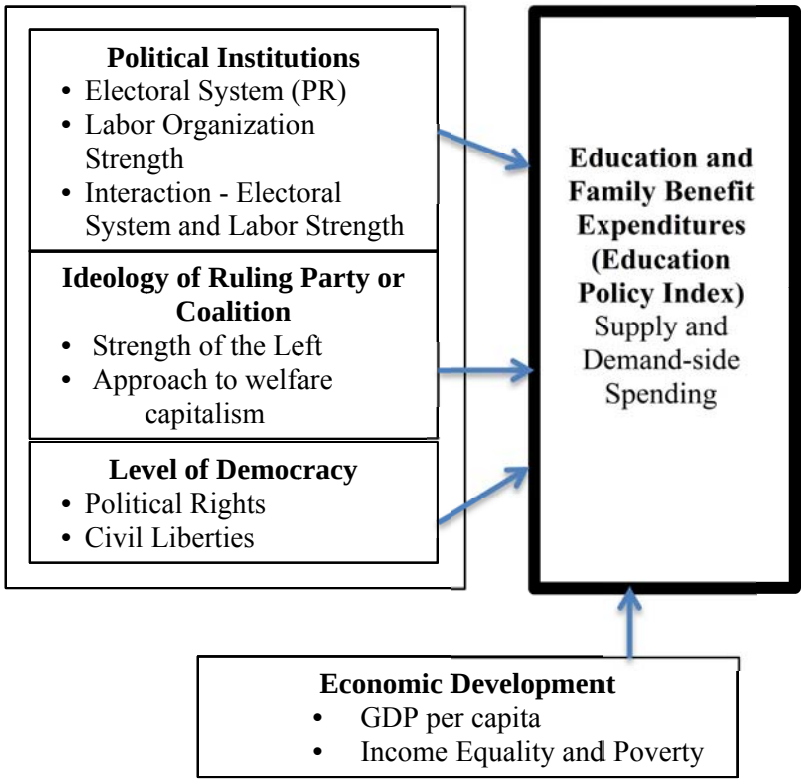
Wealth explains 14% of the EPI-A or the balance of all demand-side and supply-side spending, but none of the EPI-M. These findings imply two things. First, means-tested policies, or policies that target only the poorest based on their income, are not determined based on the wealth of the country – they appear to be politically driven

[13] Calculations are based on the adjusted R-square of four simple linear regression models with the independent variable being each country's GDP per capita and the dependent variable being each country's percent of GDP allocated (in turn) to supply and demand-side spending, supply-side spending only, demand-side spending only, and means-tested demand-side spending only.

decisions. Second, though a country's wealth explains a fair amount of how much a country is willing to spend on these policies, it is only part of the story and the political factors should be considered.

This chapter explores the political and institutional components that impact why countries vary in their policy expenditures. Figure III-1 presents the part of the human capital development and economic growth model presented in Figure I-1 that this chapter discusses in detail. By examining the political and institutional components that inform how much countries invest in families and education, the differences between countries' expenditures can be better understood.

Figure III–1. The Conditional Model of Human Capital Development



Theories of redistribution built around government ideology, countries' electoral systems, and the strength of unions as well as countries' commitment to civil liberties and political rights, are explored in the analysis presented in this chapter. Left leaning parties, proportionally representative election systems (PR), and the strength of unions explain a great deal of the variation in the way countries spend on education and family benefits. The findings show that more left leaning systems and governments that have both a PR system and strong unions, will provide more benefits to families. Moreover, as will be discussed in Chapter IV, these policies in turn impact a country's level of social and human capital that ultimately impedes or supports a country's economic growth.

Section 3.1 discusses the political science and sociology literature that addresses government redistribution policies and how they relate to education and family-benefit expenditures. **Section 3.2** puts the policy expenditures into a budgetary context, and **Section 3.3** addresses how the institutional factors influence the level of country expenditures on such policies. A model for testing the theoretical factors is presented and analyzed in **Section 3.4.**

Section 3.1. The Redistributive Nature of Education and Family-Benefit Policies

Both education and family-benefit policies are social in nature because they "address social problems and/or provide employment supports" (Adema 2006, 14). In the literature on welfare and social spending, however, education is not always included. Iversen and Stephens (2008) argue that this is a mistake. "Skills and education are at the core of the welfare state. Incentives to acquire particular types of skills are closely

related to both social protection and economic performance, and educational spending is not only a partisan issue but also one with profound implications for the distribution of income" (Iversen and Stephens 2008, 602). As a social policy, education does provide a universal good that any family, regardless of their income level, can use. As a universally provided good, however, it is not necessarily redistributive.

Ansell (2010) has argued that education spending is redistributive only in so far as "*who* actually receives that education" (3). University spending he explains can be regressive since the wealthy more often take advantage of public higher education. In primary and secondary schools, it is a bit more complicated when non-government supported or managed private schools are taken into account. If wealthier families opt out of public schools altogether then the redistributive nature of school spending would be quite high. However, most countries' primary and secondary public and government-dependent private schools serve 90% or more of the school-aged population, so both rich and poor are accessing this publically provided good at least to some extent (OECD 2012c, Table C1.4, 333). Iversen and Soskice (2009) claim definitively that spending on primary and secondary schools "benefits low-income groups more than high-income groups," but this is not a certainty (454). Jensen (2011), who looks at overall education spending at all grade levels, argues that so long as taxation is progressive, public education will be redistributive *but* that spending on education is among the least redistributive programs in which governments can invest. "It is even the case that high-income groups use publicly provided education *more* than low-income groups because full usage is conditioned on high levels of cultural capital, something that all else equal

favors high-income groups" (Jensen 2011, 413).[14] Supply-side spending, spending on education, therefore, is redistributive to some extent, but how redistributive is it relative to demand-side spending or family benefit programs and financial aid?

Financial aid at the primary and secondary school level is means-tested and targets children who come from families who are struggling economically. Means-tested family benefits are policies designed to target only the poor as well; beneficiaries are determined based on their economic need. These types of policies in the welfare capital literature are considered "liberal" because they typify a *laissez-faire* approach to governance – they minimize government involvement in marketplace outcomes; the United States is often used as the prototype of this category. In this approach, the government only steps in to assure a basic standard of living but keeps beneficiaries tied to their market conditions – in Esping-Andersen's (1990) terms, this keeps beneficiaries commodified. A country's welfare system in this literature is evaluated based on "the degree to which a (social) service is rendered as a matter of right, and the degree to which a person can maintain a livelihood without reliance on the market" (Arts and Gelissen 2002, 141).

In his seminal work, *The Three Worlds of Welfare Capitalism*, Gøsta Esping-Andersen (1990) introduces the three types of welfare capitalism: liberal, conservative, and social-democratic. These categories are based on countries' healthcare, unemployment, sick leave, and poor relief policies, as well as pension schemes (Table 3.1, 70-1). The liberal regime's approach to welfare is described above. The

[14] Cultural capital here refers to the societal norms and knowledge children inherit from their parents or families; this includes going to school and pursuing higher education.

conservative welfare system is one that moderately tries to decommodify policy beneficiaries but does so based on occupational groupings so that social benefits depend on previous contributions. Countries such as Germany, Austria, France, Italy, and Belgium most strongly fall into this category with their legacy of guilds and preferential benefits to civil servants.

Social-democratic countries are those that offer policies that try to minimize the commodification of its citizens. Mostly Scandinavian, the countries in this category consider benefits to be a social right and provide universal benefits. Table III-1 lists Esping-Andersen's (1990) categories of countries and where they fall in this scheme.

Each country's score in the capital welfare typology is based on a variety of stratification indices. If a country has more than two pension schemes that are occupationally based, for example, and if civil servants receive special consideration, these countries receive a higher score on the conservative index; the conservative scale also considers the percentage of pensions that are based on private funds. The liberal scale is based on the percentage of all social benefits that are means-tested, and for the social-democratic scale, scores are based on the percentage of the population that benefits from a set of programs. When more than 86% of a population benefits from social programs, the country scores high on the social-democratic scale, if less than 60% of the population benefits, it scores low. The other consideration for the social-democratic category is the average difference between the basic and maximum benefit payouts for sickness, unemployment, and pensions.

Table III–1. Country Welfare Capital Scores

	Degree of Conservatism	Degree of Liberalism	Degree of Socialism
Australia	Weak (0)	**Strong (10)**	Medium (4)
Austria	**Strong (8)**	Weak (4)	Weak (2)
Belgium	**Strong (8)**	Weak (4)	Medium (4)
Brazil	N/A	N/A	N/A
Canada	Weak (2)	**Strong (12)**	Medium (4)
Chile	N/A	N/A	N/A
Czech Republic	N/A	N/A	N/A
Denmark	Weak (2)	Medium (6)	**Strong (8)**
Estonia	N/A	N/A	N/A
Finland	Medium (6)	Weak (4)	**Strong (6)**
France	**Strong (8)**	Medium (8)	Weak (2)
Germany	**Strong (8)**	Medium (6)	Medium (4)
Hungary	N/A	N/A	N/A
Iceland	N/A	N/A	N/A
Ireland	Medium (4)	Weak (2)	Weak (2)
Israel	N/A	N/A	N/A
Italy	**Strong (8)**	Medium (6)	Weak (0)
Japan	Medium (4)	**Strong (10)**	Weak (2)
Korea (South)	N/A	N/A	N/A
Mexico	N/A	N/A	N/A
Netherlands	Medium (4)	Medium (8)	**Strong (6)**
New Zealand	Weak (2)	Weak (2)	Medium (4)
Norway	Medium (4)	Weak (0)	**Strong (8)**
Poland	N/A	N/A	N/A
Portugal	N/A	N/A	N/A
Slovak Republic	N/A	N/A	N/A
Slovenia	N/A	N/A	N/A
Spain	N/A	N/A	N/A
Sweden	Weak (0)	Weak (0)	**Strong (8)**
Switzerland	Weak (0)	**Strong (12)**	Medium (4)
Turkey	N/A	N/A	N/A
UK	Weak (0)	Medium (6)	Medium (4)
United States	Weak (0)	**Strong (12)**	Weak (0)

*Adapted from Table 3.3 in Esping-Andersen (1990), 74

These categories have maintained a fair amount of traction in the twenty years they have been applied and scrutinized in social science research (Arts and Gelissen 2002). Family benefits, however, are not explicitly included in the typology and this has met with a variety of challenges (Sainsbury 1994).[15] Some researchers have argued that beyond the state and the market, the family has played a significant role in providing welfare benefits such as caring for the elderly and the young, and taking care of the women who are usually charged with such responsibilities (Bryson, et al. 1994). As women have challenged traditional gender roles and have become incorporated into the formal labor market, as they have become more commodified, their role in society has changed. Accordingly more benefits are needed to assist women who now need to take time away from work to give birth, as well as care for young children or elderly family members (Siaroff 1994, Trifiletti 1999). Men also need to receive such benefits as they are now expected to share in parenting and care-taking obligations, thus these benefits are considered family benefits.

Trifiletti (1999, 54) argues that depending on how a system integrates women into the workforce and provides for their families, there are actually four types of welfare regimes: 1) liberal and 2) universalist (these minimize gender discrimination and consider women part of the workforce), and 3) breadwinner and 4) Mediterranean (these maximize gender discrimination and reinforce women's roles as wives and mothers rather than as part of the workforce). Liberal and Mediterranean regimes are seen to

[15] Neyer and Andersson (2008) argue that the Esping-Andersen (1990) typology does not work when evaluating "the effect of family policies on fertility and childbearing behavior" (706). Since this dissertation and this chapter in particular is concerned with spending and not reproductive decisions, Neyer and Andersson's concerns are not addressed.

leave women unprotected from the market whereas breadwinner policies such as those in Germany and Ireland, and universalist policies such as those in Sweden, protect women from market forces.

The breadwinner regimes, according to Trifiletti, include those countries in which women receive benefits through their husbands and mostly work part-time. Since they are protected as wives and mothers in these countries, Trifiletti argues that women are subsequently protected from the market. She is incorrect on two fronts. First, married women are tied to the market through their husbands. Second, for women who are not married and work full time, their social benefits are tied to their income, so they also do not escape the market. This makes those countries in the breadwinner category very similar to those in the Mediterranean one since the market plays a significant role in determining the level of women's benefits. Moreover, the women in breadwinner and Mediterranean countries are generally expected to fulfill the child and elder care responsibilities of the extended family. Thus, in both categories women's benefits are determined more from their role as daughters, sisters, wives, or mothers than they are by the labor market. Trifiletti's distinction between breadwinner and Mediterranean regimes then, appears to be a false dichotomy and countries in these categories could better be understood using Esping-Andersen's market-based conservative typology that also takes into consideration how women's roles are understood by society.

As described earlier, conservatism is tied to how much countries differentiate non-means-tested payments between beneficiaries. Applying Trifiletti's typology to Esping-Anderson's three worlds of welfare capitalism means considering not just the

market and payment differentials, but also how women are treated by social policies. Countries that consider women to be workers who are tied to the market (just as men are) would be considered liberal or universal, and those that consider women based on their family roles are conservative. Since the benefits discussed in this dissertation center around the family, how these specific benefits fit into Esping-Andersen's scheme merits further discussion.

Table III–2. Family Benefits Up Close and Personal

Cash benefits		
	Family allowances	
		Family or child tax benefits
		Parenting payment (Single and Partnered)
		Single Income Family Bonus
		Back to School Bonus
		Family support (egalitarian benefits)
		Conditional Cash transfer benefits
	Maternity and parental leave	
		Maternity/parental leave benefit
		Income maintenance benefit in the event of childbirth
		Parental leave benefits
	Other cash benefits	
		Partner allowance
Benefits in kind		
	Day care / Home-help services	
		Home help
		Child day care
	Other benefits in kind	
		Services for families with children
		Family and child welfare

Table III-2 profiles the family benefits considered part of the demand-side spending that is central to the EPI-A and EPI-M. The benefits listed are a broad summary of those offered in the 33 countries included in the dataset used throughout this dissertation; the second level categories come from the sub-categories used in the Organization for Economic Co-Operation and Development (OECD) Social Expenditure Database (SOCX). Cash Benefits/family allowances are designed to keep families out of dire straits when they grow and usually increase depending on the number of children that are part of the legally recognized family unit; in some countries (e.g., Australia and South Korea) there are additional monies for families that are single income. Income maintenance is the priority of maternity/parental benefits. These exist for families in which the mother and/or father has been working and is often not available unless the parent has been working for a minimal period of time. Family Benefits in Kind are tied to day care and home help in the case of caring for the elderly.

These benefits are highly variable across countries. For those benefits that are mean-tested, they can be categorized as liberal since they are always market-based, treat men and women as workers, and are as minimal as possible for families in need – they are not designed to secure a middle class level of income for recipients. Family benefits that would be considered conservative are market-driven in so far as they are determined by past income and do not guarantee a family wage. Further, they primarily consider women in their gendered roles rather than as equal members of the labor force. Lastly, the Scandinavian or universalist (social-democratic) regimes treat women as workers and protect them from the market as much as they would their male counterparts.

To summarize, for the purposes of this dissertation, countries that are considered universalist are likely to invest more heavily in family or demand-side benefits than in education to decommodify its population. Liberal regimes with their market-driven approach to welfare, will invest more in education, and conservative regimes will be a bit more generous to family and students than liberal regimes but would be expected to invest more heavily in education (supply-side policies).

> *Hypothesis 3.1: Countries that are considered liberal welfare regimes will allocate more resources to schools (supply-side policies) than to family or student benefits (demand-side policies); conservative regimes will allocate funds a bit more evenly whereas universalist regimes will devote more resources to demand-side policies.*

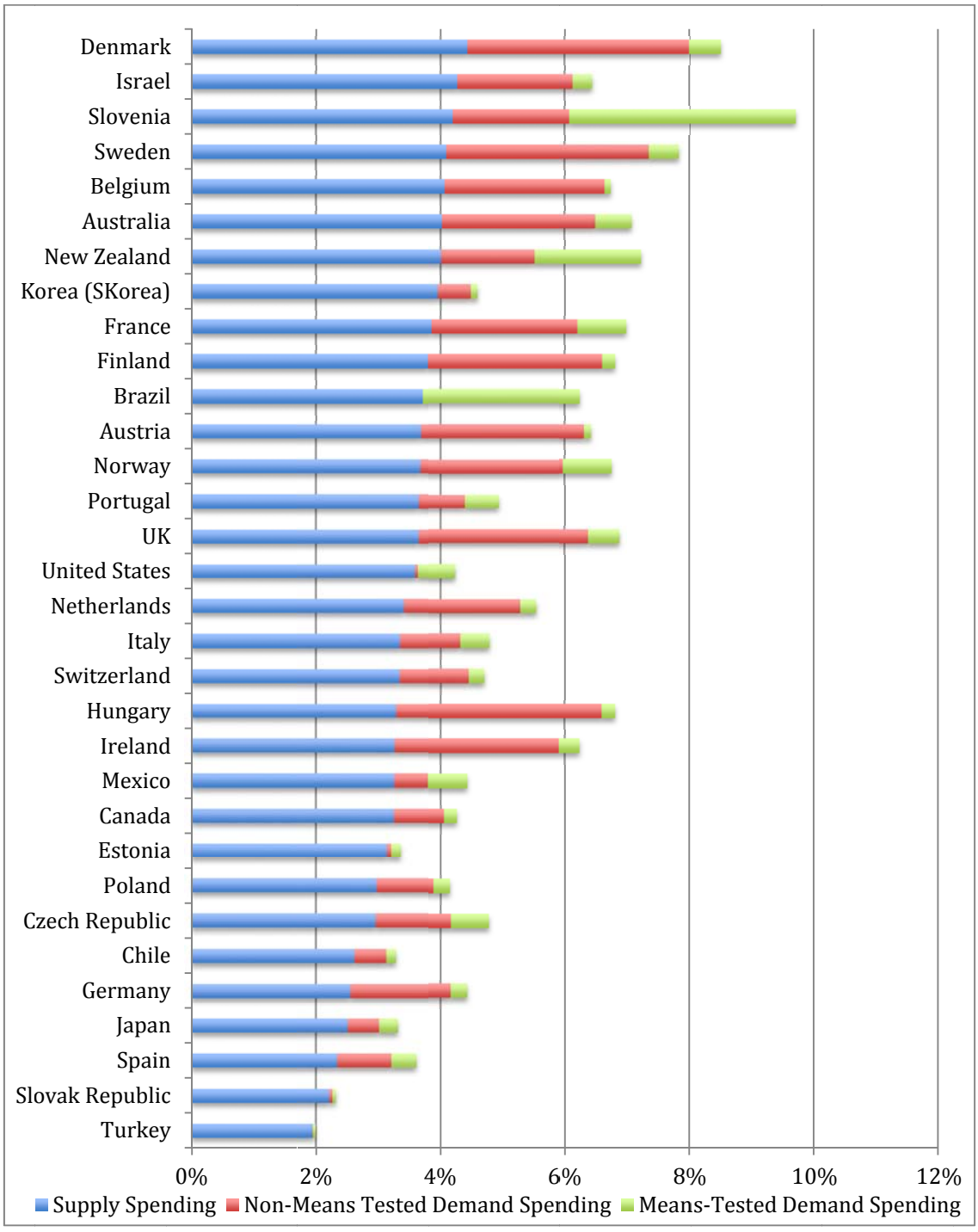
Liberal and conservative regimes do not guarantee that the level of family benefits they provide will keep children from poverty; reliance on the market to determine payments keeps a portion of the population poor. When family benefits are paid in these regimes then, since they are means-tested, they should be considered highly redistributive since they are explicitly targeting a country's most needy families. Family benefits in universalist regimes would appear to be more redistributive than those in the conservative or liberal regimes since the benefit amounts are intended to minimize inequalities and keep everyone at a middle or higher income level. However, these countries tend to be wealthier to start with and have less overall poverty. Consequently these payments are not as redistributive as those in conservative and liberal regimes. In the aggregate though, family benefits are considered more redistributive given their family-orientation and poverty targeting than education or supply-side spending.

Therefore, throughout this dissertation, countries that spend more on family benefits than education will be considered to have more redistributive policies.

Section 3.2. How Much of the Budget Are We Talking About? Nations' Education and Demand-Side Policy Choices

Figure III-2 shows countries' supply-side spending, expenditures on primary and secondary schools, as a percentage of GDP relative to each country's means-tested and universal demand-side (family benefits and financial aid) spending. The country with the most generous education spending for primary and secondary schools in this sample, at 4% of GDP, is Denmark, followed by Israel, Slovenia, Sweden, Belgium, Australia, and New Zealand. All of these countries except for Israel are more evenly balanced in their supply and demand-side spending proportions and have an EPI-A of .60 or less (Israel has an EPI-A of .66). Slovenia (10%), Denmark (9%), Iceland (8%) and Sweden (8%) have the highest overall spending on education and family-oriented social programs as a percent of GDP – indicative of their egalitarian, universal policy orientation.

Figure III–2. Percent GDP (2006) Allocated to Demand and Supply-Side Spending



Slovenia, formerly Yugoslavia, is noteworthy as a former Communist country in that its transition to democracy and capitalism was introduced slowly and was less disruptive than it was in most other post-socialist countries (Kolarič, et al. 2011). In general Slovenia has low poverty and income inequality and has enjoyed economic success. To live a comfortable middle class lifestyle, though, families require two full-time working parents and the available family benefits reflect a commitment to working women who have a long history of full-time employment in Slovenia (Stropnik and Šircelj 2008). In terms of overall expenditures, Slovenia is the most balanced in its supply- and demand-side spending priorities of all the countries in the dataset whether looking at its EPI-A (.43) or EPI-M (.53) scores. This implies that most demand-side spending is means-tested and it is based on the large amount of financial aid provided to primary and secondary students; the family benefits portion of the demand-side spending, however, is primarily universal.

While family benefits have been an important part of Slovenia's expenditures since before the transition to democracy, education reform and spending did not become a high priority until the early 1990's after Slovenia became independent. Starting in 1991 with the Law on Organization and Financing of Education, Slovenia reorganized the education system and determined new rules for financing, increased spending, and improved their enrollment numbers (Plut-Pregelj 2001). The spending on education continued to increase as the country prepared to enter the European Union (EU) and North Atlantic Treaty Organization (NATO) in 2004 and the balance between the two types of spending in 2006 reflects these pattern. Hungary is similar to Slovenia in that its

spending between supply- and demand- is very balanced based on the EPI-A score, however, most benefits in Hungary are universal so its EPI-M score is .93 or very skewed to education spending.

Other countries in the dataset that had experience with Communism vary considerably from Slovenia and Hungary. Formerly Czechoslovakia, the Czech Republic and Slovakia today have two very different approaches to spending on education and demand-side spending. The Czech Republic has an EPI- A score of .62 and an EPI-M score of .83 indicating that most of the demand spending is universal (38% of demand-spending is actually means tested) and that education spending is a comparable priority to family-oriented social benefits. Slovakia on the other hand has the most supply-side oriented EPI in the dataset with an EPI-A score of .95 and EPI-M score of .98. Here the spending on means-tested student financial aid reflects 53% of the demand-side benefits whereas the cash benefits and benefits in kind are primarily universal. This indicates that education has been the priority for Slovakia, along with direct aid to students who are going to school, and family benefits are designed to help everyone regardless of income. Figures III-3 and III-4 show the EPI-A and EPI-M scores for all of the countries in the dataset and indicate the median score (See also Tables II-3 and II-4 in Chapter II to see how the scores break down along the spending categories).

Figure III–3. EPI-A Scores

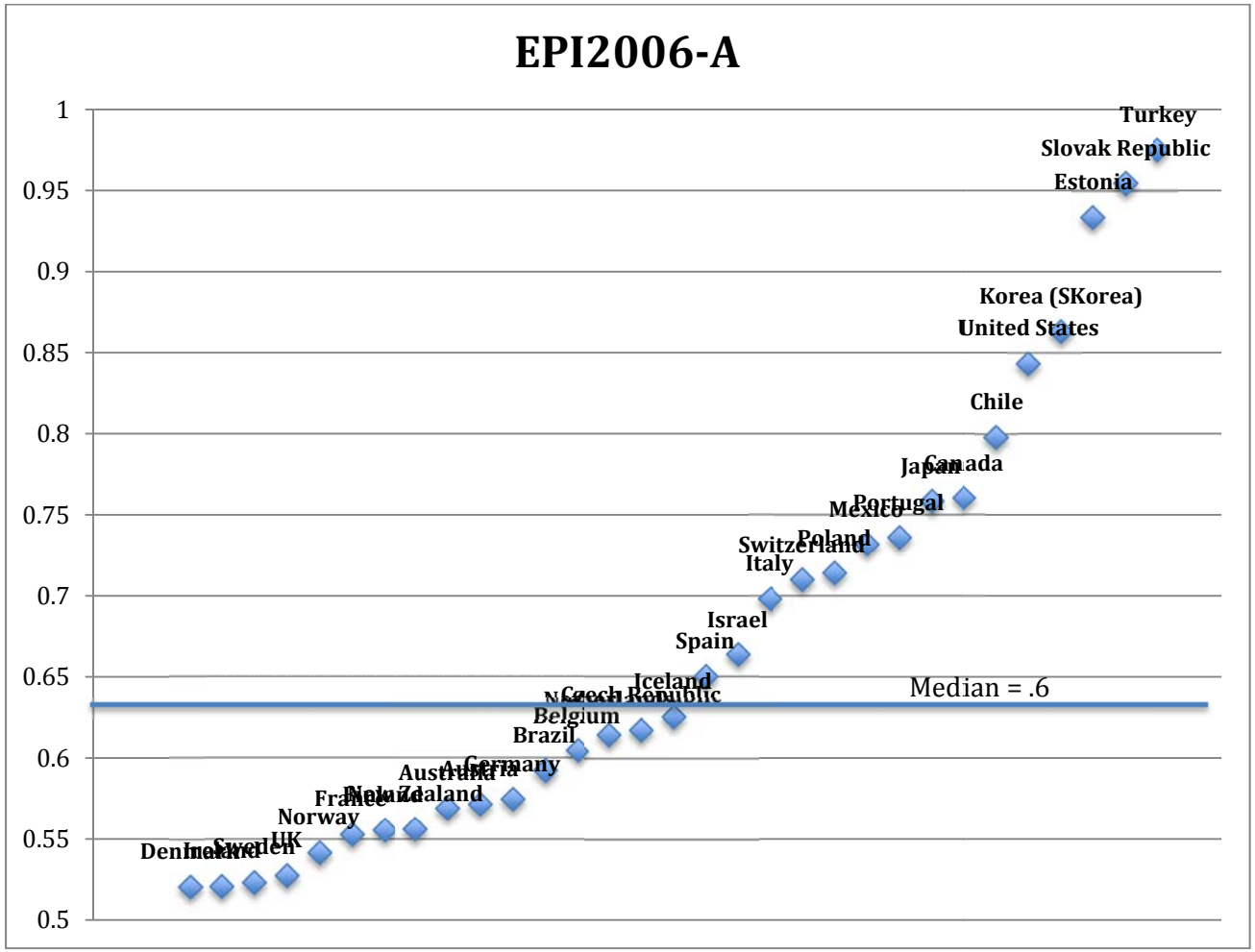
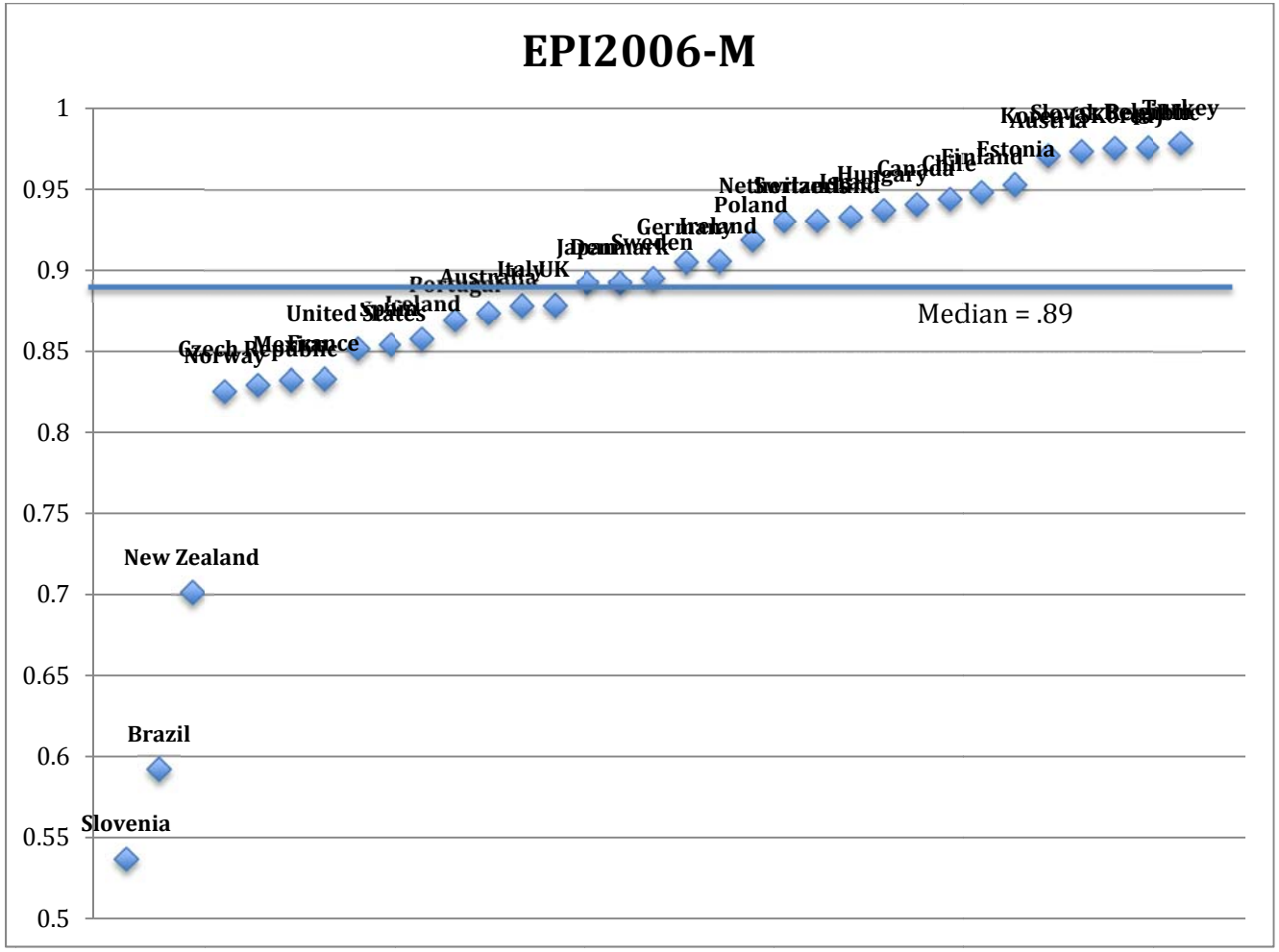


Figure III–4. EPI-M Scores



The median EPI-A score for all countries in the dataset is .60 whereas the median EPI-M score is .89. This disparity indicates that most countries in the sample provide benefits that are more universally oriented and are not means-based. The countries with the most 2006 means-tested demand-side policies are Brazil (100%), the United States (94%), and Turkey (85%). The OECD shows that these countries' 2010 Gini index or inequality scores vary considerably: Brazil has a .55 Gini index score, Turkey an index score of .41, and the U.S. a Gini index score of .38.[16] While Brazil has a poverty rate of 21%, Turkey and the U.S. are not far behind with each having a 17% poverty rate. Table III-3 shows the poverty rates and GINI scores for each country in the dataset. The only countries with comparable poverty rates are Mexico (21%), Israel (20%), and Chile (18%).[17]

[16] With the exception of Brazil, the 2010 Gini index scores are from the OECD Country Statistical Profiles database; Brazil's 2009 score comes from the World Bank (2009) database of World Development Indicators. The World Bank database defines the Gini index as "the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. Thus a Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality" (World Bank "World Development Indicators - Aggregated Database" 2009, OECD "Country Statistical Profiles Database" 2011e).

[17] The poverty rates listed here are from the OECD "Country Statistical Profiles Database" 2011e and represent the poverty ratio from the late 2000's. The poverty ratio is defined by the OECD 2010 Factbook as "The ratio of the number of people who fall below the poverty line and the total population; the poverty line is here taken as half the median household income. However, two countries with the same poverty rates may differ in terms of the income-level of the poor" (OECD 2010d, 236).

Table III–3. Country Poverty and GINI Scores

Country	GINI Score	Poverty Rate
Brazil	0.55	**21%**
Chile	0.49	**18%**
Mexico	0.48	**21%**
Turkey	0.41	**17%**
USA	0.38	**17%**
Israel	0.37	**20%**
Portugal	0.35	12%
UK	0.34	11%
Italy	0.34	11%
Australia	0.34	**15%**
New Zealand	0.33	11%
Japan	0.33	**16%**
Canada	0.32	12%
Spain	0.32	14%
Estonia	0.32	12%
Korea	0.32	**15%**
Poland	0.31	10%
Switzerland	0.30	9%
Iceland	0.30	6%
Germany	0.30	9%
Netherlands	0.29	7%
Ireland	0.29	9%
France	0.29	7%
Hungary	0.27	6%
Austria	0.26	8%
Finland	0.26	8%
Sweden	0.26	8%
Belgium	0.26	9%
Slovak Republic	0.26	7%
Czech Republic	0.26	5%
Norway	0.25	8%
Denmark	0.25	6%
Slovenia	0.24	8%

NOTE: Countries with a poverty rate of 15% or greater are in bold.
SOURCE: OECD "Country Statistical Profiles Database" 2011e

A closer look at how poverty rates are impacted by supply-side, means-tested, and non-means-tested demand-side expenditures reveals that poverty is lower for the countries in this dataset that spend more on non-means-tested demand-side policies.[18] In Chapter IV these decisions' impact on educational outcomes will be addressed but first it is important to identify which institutional factors influence the type of spending countries prioritize. Accordingly, the next section addresses the key aspects of countries' political institutions that help explain their EPI-A and EPI-M scores.

Section 3.3. Which Political and Ideological Factors Matter?

Democratic Political Institutions

Under democracies, governments provide more public goods and are more redistributive than under authoritarian regimes (Przeworski, et al. 1999, Kaufman and Segura-Ubiergo 2001, Lake and Baum 2001, Brown and Hunter 2004, Avelino, et al. 2005). Electoral systems in particular influence how generous governments will be once they take control of a country's budget. Democracies that elect their leaders via proportional representation (PR) systems tend to be more redistributive than majoritarian systems (Iversen and Soskice 2006, 2009). According to Iversen and Soskice (2006), the reason for this leftist tendency in PR systems is that the middle class/centrist party can ally with left-leaning parties and influence policy differently than in majoritarian

[18] A linear regression model (with p =.002) was run with countries' poverty rate as the dependent variable and the percent of spending on supply-, means-tested demand- and non-means-tested demand-side spending as the independent variables of interest. The only variable that was having an impact on reducing poverty was non-means-tested demand-side spending at p=.001. None of the other variables were significant including the GDP per capita control variable.

systems. In a PR system, the middle class can benefit more from taxation on the wealthiest whereas in majoritarian systems the middle class will be included in higher taxes if the left is in control of policy (166). Accordingly we would expect to see PR systems spend more heavily on demand-side policies that are more redistributive than education spending.

> *Hypothesis 3.2: Proportionally Representative (PR) Systems will spend relatively more than majoritarian systems on demand-side policies that are student and family-oriented than on supply-side policies that target schools and teacher wages.*

The level of a country's democratization is another component of how much a country redistributes its wealth (Iversen and Soskice 2006, Iversen and Stephens 2008, Iversen and Soskice 2009). Democratic countries that value citizens' political rights and civil liberties, would be expected to spend a great deal on education to assure an electorate that can make rational voting decisions. Accordingly they will want to reach as many constituents as possible and education is a way to reach families and garner political support. David S. Brown and Wendy Hunter (2004) argue that "democratically elected politicians would be especially likely to direct resources to the primary [education] level, because such an approach would benefit the largest number of potential voters" (845). In his analysis of democracies and their levels of education spending, Ansell (2008) confirms that democratization increases primary education spending.

Highly democratic countries are also expected to provide a safety net for its population so that poorer citizens are not living in poverty and will support the

government (and vote for incumbents). Yet, redistributive spending should be geared toward educating the populace for three reasons. First, as mentioned above, politicians want to reach as many potential voters as possible and education is an easy way to do that (family benefits primarily benefit the poor). Second, the work force needs to be educated to provide a skill level that benefits the economy and third, an educated electorate will be able to capably participate in the workings of government (Castelló-Climent 2008; Iversen and Stephens 2008; Brady et al., 1995).

> *Hypothesis 3.3: More democratic countries will invest more in education (supply-side policies) than in family and student benefits (demand-side policies) to assure that citizens are able to participate in the economy as well as the running and monitoring of government.*

Partisan Ideology, Labor Unions and Redistribution

Left-leaning governments have been found to be more distributive and redistributive than those that are more conservative (Bardhan 2002). The ideological position of the government can change each election and, provided the legislature and the executive pass new laws, the policies they pass should reflect their ideological preferences (Cusack 1997). The challenge with capturing such policies' effectiveness, however, is twofold. First, if the policy itself is meant to be more of a symbolic policy than an implemented one, it may not get funding; budget allocation therefore is a key part of this analysis. A second reason to include funding is that if a new administration with a distinctly different ideological position from their predecessor is elected, the new administration might increase or decrease the program's budget. A new administration

might also reprioritize the bureaucratic effort by limiting funds to certain programs, implementing a previously symbolic program, or overturning a policy altogether before the policy's impact can be measured. Partisan theory claims that "parties in power have an impact on policy output … [and] government parties of the left and of the right behave differently in government and pursue different policy programmes" (Imbeau, et al. 2001). This is why the budgets are the key to understanding what is actually happening in the lives of students and their families. The EPI-A and EPI-M provides a lens for seeing what investments are being made and can be evaluated based on the government's ideology.

Another complexity around spending and ideology stems from politicians' intention – what are they trying to signal and to whom? Hibbs (1992) argues that spending reflects a commitment to voting constituencies. Between 1990 and 2006, Potrafke (2011) claims that "education has become an important expenditure category for leftist parties to signal their political visions to voters belonging to all societal groups" (101). Research into education spending allocations by social democrats (left-leaning parties) has made a distinction between higher education spending and primary and secondary school investments. Both types of institutions benefit fiscally from left-leaning government leadership, but higher education institutions may benefit even more to expand the core constituency to include higher middle class voters (Boix 1997, Busemeyer 2009). The remarkable finding by Busemeyer (2008, 118) for the purposes

of this dissertation is that spending on all education increases by as much as 10% when left-leaning parties have more legislative power.[19]

When considering supply-side, education benefits relative to family and student benefit spending, however, elected official who are members of left-learning parties will need to signal that they are taking care of their core constituency. The immediate benefit to constituents would be in the form of family benefits rather than education since such spending impacts more constituents and is more redistributive. Thus, while both policy types are important to left learning political leaders, families will benefit more.

> *Hypothesis 3.4: Left-learning governments will spend more on demand-side policies that are student and family-oriented than on supply-side policies that target schools and teacher wages.*

Power Resource Theory (PRT) helps to put the ideological leaning of government in an institutional context – institutions can limit how much power political groups such as parties and unions can have over policies and expenditures. Research has shown that the organizational strength of the working class and the historical strength of the political left will influence how redistributive a government will be (Hicks and Swank 1984, Murillo 1999, Grindle 2004, Iversen and Soskice 2009). Spending on welfare policies will therefore be expected to increase when left-leaning (social democrat) parties and labor unions have political power. Moreover, when labor unions are strong within a proportionally representative system, where parliamentary

[19] Busemeyer (2008) shows that higher education spending increases by 23% versus 17% for primary/secondary/non-tertiary when leftist parties are controlling the government (118).

committees provide special interest groups with access to legislation, family benefits would be expected to be high (Korpi 2006, Iversen and Soskice 2009).

> *Hypothesis 3.5: When a country has strong unions and a PR (proportionally representative) electoral system, spending on supply-side expenses (schools and wages) would be expected to be lower relative to demand-side spending (expenditures that go directly to students and families).*

One contention with this hypothesis might be that unions are primarily expected to advocate for wages or supply-side spending, but unions do both – they promote higher wages *and* more benefits. This is especially true for primary and secondary teachers who generally have low salaries, and who are usually women. In fact, over 65% of primary and secondary school teachers worldwide are women and research has shown that when a higher percentage of teachers are women, teacher salaries are lower (Dolton and Marcenaro-Gutierrez 2011). Benefits may be the one area where teachers and their unions are able to compensate for their lower salaries – especially family benefits.

Since teacher unions vary considerably in their strength across countries, assessing their institutional impact on spending needs to be considered in the context of the overall strength of unions within each country. Moreover, since all unions are expected to advocate for better family benefits in addition to better wages for their particular members, when unions have power, family benefits would be expected to be higher as indicated with *Hypothesis 3.5*. The level of teacher union influence over decision-making and in enacting policies can ultimately impact human capital outcomes – especially if unions' efforts result in higher teacher pay and job security at the expense

of teacher quality or student resources (Jafarey and Lahiri 2005). This will be further discussed in Chapter IV when the factors that impact student outcomes are evaluated.

Section 3.4. Measuring Political Institutions and Government Ideology Impact On Country EPI Scores – Data and Methods

Appendix B summarizes the hypotheses presented in the previous sections and outlines how these variables will be measured along with their expected relationship to the EPI-A and EPI-M. In Section 3.2 *Hypothesis 3.1* was presented as a way to show how welfare-spending regimes differ in their impacts on the EPI-A and EPI-M. Liberal regimes, with their reliance on market forces, are expected to spend more on education (supply-side policies) regardless of whether or not it is EPI-A or EPI-M as the dependent variable. Conservative regimes are also expected to favor education over family and student benefits whereas Social regimes will be expected to favor demand-side policies (family and student benefits) over education or supply-side spending.

To test these assertions a linear regression model was run with the EPI-A and EPI-M as the dependent variables, and the countries' regime types (listed in Table III-1) as the independent variables. The degree of liberal policy orientation for each country is indicated with L_c, Conservative orientation with C_c, and Social orientations is indicated with S_c. The countries' Gross Domestic Product per capita (GDPpc) is used to control for the wealth of the countries.

$$EPIA_c = \beta_0 + L_c\beta_1 + C_c\beta_2 + S_c\beta_3 + GDPpc_c\beta_4 + \varepsilon \qquad \textit{eq. 3.1a}$$
$$EPIM_c = \beta_0 + L_c\beta_1 + C_c\beta_2 + S_c\beta_3 + GDPpc_c\beta_4 + \varepsilon \qquad \textit{eq. 3.1b}$$

While the model with the EPI-M as the dependent variable is not significant, the EPI-A model is significant at $p<.01$ and has an adjusted R^2 of .53. Since Esping-Andersen is the data source for the regime types, there are only 18 countries evaluated and the results are shown in Table III-4.

Table III–4. Regime Type and Balance of Supply- and Demand-Side Spending

Independent Variables	EPI-A	EPI-M
Liberal Regime	.02 (.01)*	.01 (.00)
Conservative Regime	-.00	.01 (.01)
Universalist Regime	-.01 (.01)	.01 (.01)
GDPpC	.00 (.00)	.00 (.00)
Model p-value	.01	.36

NOTES: N=18, Standard errors are in parentheses, *p=.01

The results indicate that of these countries, liberal regimes invest significantly more in education than in family and students (demand-side benefits). So the more economically liberal (the more market oriented) the country, the more education spending is prioritized over family benefits. Moreover, though the countries with a higher degree of socialism, those countries that have a larger social score, do not have significance (p=.11), the coefficient is negative indicating that these countries have a tendency to spend more on family benefits. As mentioned earlier, the EPI-M model (equation 3b) is not significant but the conservative regimes' spending is significant at $p<.10$ and is in the expected direction implying a larger focus on supply-spending over family and student benefits.

As discussed in the previous section, countries' leadership ideology, electoral system, prioritization of civil liberties and political rights, and its wealth will affect the balance of supply- and demand-side spending. Further, the ability of the working population to organize and negotiate their wages, along with the depth of individuals' political rights and civil liberties should have an impact on how countries choose to spend their resources.

To test these hypotheses, the following equations are used:

$$EPIA_c = \beta_0 + I_c\beta_1 + PR_c\beta_2 + UP_c\beta_3 + PRUP_c\beta_4 + FH_c\beta_5 + PC_c\beta_6 + GDPpc_c\beta_7 + \varepsilon \qquad \textit{eq. 3.2a}$$

$$EPIM_c = \beta_0 + I_c\beta_1 + PR_c\beta_2 + UP_c\beta_3 + PRUP_c\beta_4 + FH_c\beta_5 + PC_c\beta_6 + GDPpc_c\beta_7 + \varepsilon \qquad \textit{eq. 3.2b}$$

In equation 3.2a, the dependent variable is $EPIA_c$, the Education Policy Index for each country that includes *all* demand-side spending estimates (means-tested and non-means-tested family and student benefits). In equation 3.2b, the dependent variable is $EPIM_c$, the Education Policy Index for each country that includes only means-tested family and student benefits in the demand-side spending estimates. The independent variables in the equations are the same. I_c is the ideology of the country's government between left and right, PR_c is whether or not the government is elected via a proportional representative system or not, UP_c is the strength of the union's power, $PRUP_c$ is the

interaction between the electoral system and the union's strength, FH_c is the country's Freedom House score, PC_c is the level of the country's political constraint, and $GDPpc_c$ is the country's wealth per capita.

The country's ideology score is based on the World Bank's Database of Political Institutions (DPI). The DPI codes a government's executive based on his or her party affiliation and codes the legislature's ideology based on the party that has the most votes; party orientation is determined based on the party in charge's platform with respect to economic policy.[20] Parties are coded as "right" if they self identify as conservative, Christian democratic, or right-wing. Left parties are defined as communist, socialist, social democratic, or left-wing, and parties are considered centrist if they define themselves as such or "when party position can best be described as centrist" (Keefer 2010). Given that six countries in the dataset have presidential systems (Brazil, Chile, South Korea, the Netherlands, Poland and the United States), the executive's ideological orientation is especially relevant. Of the 28 countries for which there is available data, the ideological orientation of the executive, however, is nearly 100% correlated with the ideological orientation of the largest party in the legislature; In 2006 only Iceland had an executive with a different ideology than the largest party in government. Subsequently, either the executive or legislative ideology could be used in the model. Given the presidential orientation of several countries in the sample, the executive ideology variable is used but the results from running the models with the

[20] The World Banks's Database of Political Institutions codebook states that, "if there was evidence that the executive deviated considerably from the party orientation (e.g. austerity policy of a socialist / social democratic party) the executive's orientation is recorded in the database, not the party's. In addition, if executive is independent, the executive's orientation is recorded" (World Bank 2012b).

legislative ideology variable are presented in Appendix D and the results are the same.

The Quality of Government (QOG) Dataset compiled by the QOG Institute located at the University of Gothenburg categorizes countries' electoral systems in three ways: (1) Majoritarian, (2) Mixed, or (3) Proportional (PR). Majoritarian systems elect their leaders based on a majority of the votes whereas PR systems elect leaders based on the proportion of the vote received by each party, and Mixed combines these two methods in some way. The executive office of the countries in the dataset are classified as Parliamentary Monarchy (e.g., Belgium, Japan, Norway, and the United Kingdom), Presidential Republic (e.g., Brazil, Chile, Mexico, and the United States), or Mixed executive (e.g., Austria, Italy, S. Korea, and Turkey) with the exception of Switzerland. Switzerland poses a unique categorical challenge because it is ruled by a seven-member Federal Council that is supposed to be an apolitical council of experts that essentially represents four political parties from across the ideological spectrum. Since it is not ideologically distinguishable, Switzerland is excluded from the analysis in this chapter.

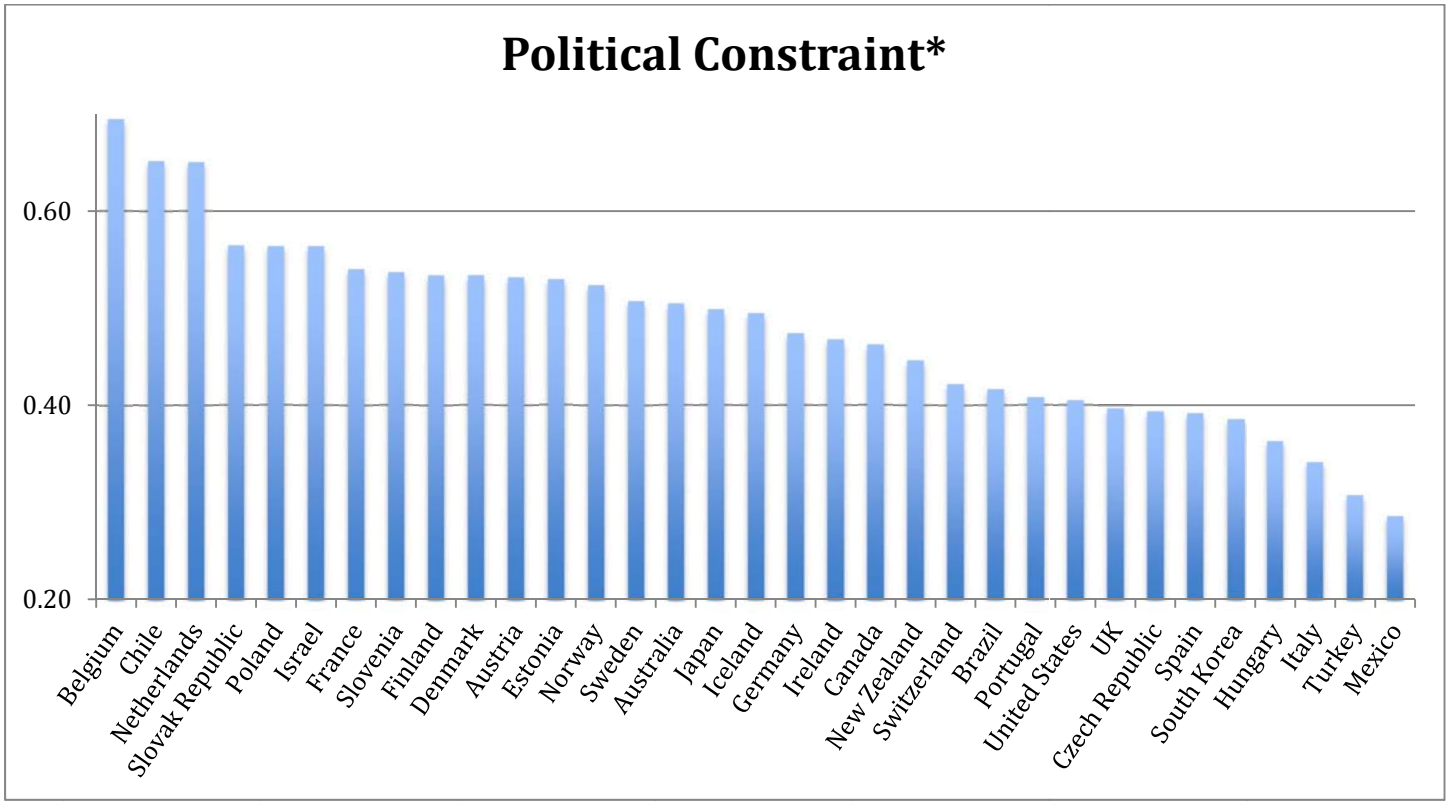
A multitude of institutional factors are known to constrain policymakers. In 2000, Witold Henisz introduced a measure designed to capture the feasibility of policy changes given a country's political institutions and associated constraints (Henisz 2000). This measure, referred to as political constraints (PC) in equations 1 and 2 above, is an index that ranges from 0 to 1 and relies on three data points: the number of institutional players with veto power over policy changes, partisan alignments (including coalitions) across institutions, and the legislature's party composition (Henisz 2000, 27). More constraint comes from a large number of veto players in the system, a lack of party

alignment across branches of government, and a lack of party alignment within branches.

In one study the PC index shows that political constraints can impact a country's infrastructure investments – the more political factors constrain political actors, the more likely there will be economic growth since policies, once made, are less likely to be changed (Henisz 2002, 362). For the research presented here, the PC index is used as a control for the ideological differences and structural challenges politicians have to overcome to implement or change policies.

Figure III-5 shows the PC scores for the countries in the dataset. The higher the score, the closer it is to 1, the more politically constrained the actors are to change policies. For the countries used in this chapter, Belgium has the highest PC score of .69. Chile and the Netherlands follow with a PC score of .65. On the other end of the scale, the countries with the lowest institutional constraints are Italy (.34), Turkey (.31), and Mexico (.29).

Figure III–5. Level of Political Constraint



*These estimates reflect the political constraint as of January 1, 2006.
SOURCE: Quality of Governance Database (QOG)

The power of unions (UP) is understood as their ability to form, negotiate for their members with employers, and have a say in business activities.[21] Based on these criteria, the QOG database compiles an index for each country in the dataset (Teorell, et al. 2012). Unions are constrained by institutions that can limit or enhance their ability to impact policies. In their discussion of coordinated and liberal market economies, Iversen and Soskice (2009) show that the type of electoral system matters for the level of welfare countries provide. Coordinated market economies are economies in which the government plays a strong role in providing social welfare benefits whereas liberal market economies provide relatively few.[22] According to their research, "coordinated market economies cluster with strong welfare states and consensus political systems; and liberal market economies cluster with weak welfare states and majoritarian political systems" (Iversen and Soskice 2009, 478). In PR systems, unions have been shown to have more access to legislative committees where they can have an impact on policy (Iversen and Soskice 2009). Accordingly, the model in this chapter includes an interaction between the type of electoral system (majoritarian, mixed, or proportional representative) and union power. A significant interaction will indicate that PR electoral systems and powerful unions affect governments' redistributive spending decisions.

[21] The measure specifically "Measures the statutory protection and power of unions as the average of the following seven dummy variables which equal one: (1) if employees have the right to unionize; (2) if employees have the right to collective bargaining; (3) if employees have the legal duty to bargain with unions; (4) if collective contracts are extended to third parties by law; (5) if the law allows closed shops; (6) if workers, or unions, or both have a right to appoint members to the Boards of Directors; and (7) if workers' councils are mandated by law" (Teorell, et al. 2012, Codebook page 29).

[22] Korpi (2006) argues that countries developed coordinated market economies as opposed to liberal market economies because of employer strategies relative to each countries' left-oriented parties and unions given political constraints and opportunities. Specifically, when left-oriented parties and unions are strong and PR electoral systems are in place, coordinated markets evolved.

The Freedom House Index provides a convenient way to assess a country's tolerance for civil liberties and political rights that will play into how open a country may be in any given year to helping those in the population that are most in need. This measure is preferable to Polity since only democratic countries are included in this analysis. Freedom House is also better because countries that value civil liberties and political rights would be expected to spend more on education; an educated populace should understand more about the political system to monitor the government effectively to avoid tyranny of the majority or manipulation of the masses by a minority. Finally, to control for the wealth and level of economic development of each country in the study, the country's Gross Domestic Product per capita (GDPpc) is included in the model.

All data used are from 2006 and are presented in Table III-5. This year was selected because it represents a three-year lag from the 2009 education outcome data that are applied in Chapter IV. Since budgets take time to be implemented, a lag of a few years gives investments time to have an impact on outcomes and this will be further explored in the next chapter.[23]

[23] Education is a cumulative investment and by the time students complete secondary school they have had up to 13 years of schooling. Spending on schools and families is thus a long-term investment and does change from year to year – especially after 2008 when the worldwide recession hit. Future analysis should incorporate more years of data to establish how elections and different government composition impact spending decisions.

Table III–5. Independent Variables Unpacked

Country	Executive Ideology (I)[1]	Largest Party Ideology[1]	Electoral System (PR)[2]	Political Constraint (PC)[3]	Union Power (UP)[4]	Freedom House (FH)[5]	GDPpc (US$)[6]
Australia	1	1	2	0.50	0.29	1	35,986
Austria	1	1	3	0.53	0.43	1	39,300
Belgium	1	1	3	0.69	0.43	1	37,919
Brazil	3	3	3	0.42	0.38	2	5,793
Canada	3	3	1	0.46	0.14	1	39,250
Chile	1	1	3	0.65	0.43	1	9,376
Czech Republic	3	3	3	0.39	0.43	1	14,446
Denmark	1	1	3	0.53	0.71	1	50,462
Estonia	.	2	3	0.53	.	1	12,503
Finland	2	2	3	0.53	0.43	1	39,487
France	1	1	1	0.54	0.67	1	35,457
Germany	1	1	2	0.47	0.71	1	35,238
Hungary	3	3	2	0.36	0.71	1	11,174
Iceland	2	1	3	0.49	.	1	54,814
Ireland	2	2	3	0.47	0.43	1	52,501
Israel	1	1	3	0.56	0.29	1.5	20,625
Italy	1	1	2	0.34	0.43	1	31,777
Japan	1	1	2	0.50	0.71	1.5	34,102
S. Korea	2	2	2	0.38	0.71	1.5	19,676
Mexico	2	2	2	0.29	0.57	2	8,831
Netherlands	1	1	3	0.65	0.43	1	41,459

Table III-5, continued

Country	Executive Ideology (I)[1]	Largest Party Ideology[1]	Electoral System (PR)[2]	Political Constraint (PC)[3]	Union Power (UP)[4]	Freedom House (FH)[5]	GDPpc (US$)[6]
New Zealand	1	1	2	0.45	.	1	26,173
Norway	3	3	3	0.52	0.71	1	72,960
Poland	1	1	3	0.56	0.71	1	8,958
Portugal	3	3	3	0.41	0.71	1	19,065
Slovak Republic	.	.	3	0.56	0.57	1	12,799
Slovenia	2	2	3	0.54	0.43	1	19,406
Spain	3	3	3	0.39	0.71	1	28,025
Sweden	3	3	3	0.51	0.62	1	43,949
Switzerland	.	.	3	0.42	0.33	1	54,140
Turkey	.	.	3	0.31	0.57	3	7,687
UK	3	3	1	0.40	.	1	40,481
United States	1	1	1	0.40	0.14	1	44,623

[1] Right = 1, Centrist = 2, Left = 3; SOURCE: World Bank's Database of Political Institutions

[2] Majoritarian=1, Mixed=2, Proportional Representation=3; SOURCE: World Bank's Database of Political Institutions

[3] The index scores are derived from a simple spatial model and ranges from 0 to 1, with higher scores indicating more political constraint and thus less feasibility of policy change. "The index is composed from the following information: the number of independent branches of government with veto power over policy change, counting the executive and the presence of an effective lower and upper house in the legislature (more branches leading to more constraint); the extent of party alignment across branches of government, measured as the extent to which the same party or coalition of parties control each branch (decreasing the level of constraint); and the extent of preference heterogeneity within each legislative branch, measured as legislative fractionalization in the relevant house (increasing constraint for aligned executives, decreasing it for opposed executives)" (Teorell, et al. 2012, 108). Note that the coding reflects information as of January 1, 2006. SOURCE: QOG Database

[4] Labor Union Power Index –"The average of the following seven dummy variables which equal one: (1) if employees have the right to unionize; (2) if employees have the right to collective bargaining; (3) if employees have the legal duty to bargain with unions; (4) if collective contracts are extended to third parties by law; (5) if the law allows closed shops; (6) if workers, or unions, or both have a right to appoint members to the Boards of Directors; and (7) if workers' councils are mandated by law" (Teorell, et al. 2012, 29). SOURCE: QOG Database

[5] Most free = 1, least free = 7; SOURCE: Freedom House

[6] SOURCE: OECD Country Data

What the 2006 data show in this chapter are the spending priorities of the officials who held office that year – the EPI-A and EPI-M reflect the government's expenditures under their tenure. Electoral cycles are not directly addressed in the models though the PC measure does address party conflict for the given year. For the countries included in the analysis, 12 had legislative and 4 had executive elections in 2006 whereas 9 had legislative elections and 3 had executive elections in 2005. These elections are listed in Appendix C. Although these events may have impacted 2006 spending priorities, the impact of the elections themselves are beyond the scope of this analysis, rather this analysis addresses how party ideology and institutional constraints impact the decisions political actors make once in office. Table III-7 presents the regression analysis results.

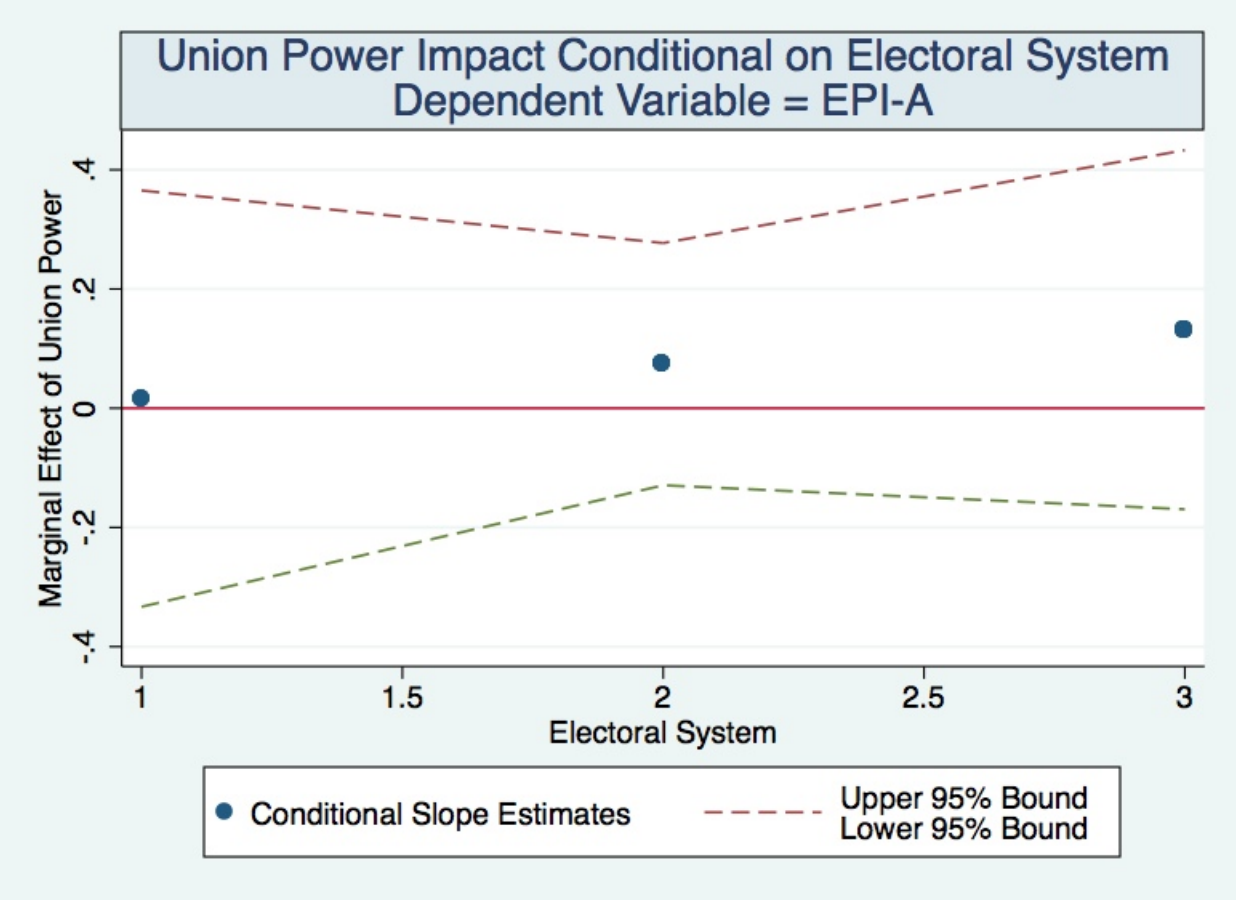
Table III–6. Institutional and Ideological Impacts on Spending Decisions

Independent Variables	EPI-A	EPI-M
Executive Ideology	-.05 (.03)*	-.03 (.03)
Electoral System	-.24 (.07)**	-.04 (.08)
Union Power	-.94 (.29)**	-.04 (.35)
Electoral System*Union Power	.42 (.13)**	.06 (.15)
Freedom Index	.12 (.07)	-.07 (.09)
Political Constraint	.01 (.27)	.06 (.32)
GDPpc	-.00 (.00)*	.00 (.00)
Model p-value	.03	.71

NOTES: N=26, Standard errors are in parentheses; Countries omitted due to lack of data are Estonia, Slovak Republic, Switzerland, and Turkey (no data for executive ideology) and Iceland, New Zealand, and the U.K. (no data for union power).
*p<.10, ** p<.01

The EPI-A model has an overall p-value of .03 and an adjusted R^2 of .36. As mentioned above, Appendix B provides on overview of the expected sign directions given the hypotheses begin tested. In summary, negative coefficients indicate a demand-side policy orientation while positive coefficients indicate a supply-side policy orientation. Of the significant independent variables the most remarkable is the type of electoral system – having a government that is proportionally representative will likely lead to more demand-side spending by as much as .25 on the EPI scale. Powerful unions will also significantly push the EPI-A measure towards the demand-side of the scale. The coefficient of the interaction of union power and electoral system cannot be directly interpreted. Figure III-6 presents the marginal effect of powerful unions given a PR system for electing officials and shows that as the electoral system moves from majoritarian to mixed to proportionally representative, the power of unions has an increasing impact on the balance of supply- and demand-side spending. This support for *Hypothesis 3.5* is significant in that it confirms the importance of unions and electoral systems for budget allocations. This significance, however, is interactive and one without the other will likely have a different outcome for beneficiaries.

Figure III–6. Marginal Effects of Union Power Conditional on the Electoral System



Section 3. 5. Conclusion

This chapter has shown that political institutions and the ideology of decision makers have an impact on governments' spending priorities between supply-side (education) and demand-side (family and student benefits) policies. Namely, the type of electoral system will have an impact on whether or not families, regardless of their income level, will benefit from fiscally redistributive policies as much as or more than schools will. Based on the analysis presented here, those countries that elect their representatives via a PR system are going to be more redistributive and assure families a higher level of benefits than governments that are elected via a majoritarian or mixed system. Further, the electoral system will affect how much unions can influence spending, and PR systems, as theory suggests, appear to give unions more leverage on such decisions than majoritarian systems do. Left-leaning governments also play a significant role regardless of how they are elected, and will push spending towards family benefits, both means-tested and non-means-tested, over schools.

At the sub-national level, these institutional and political factors are also at play, influencing state and local governments in their choice of which education policies they pass and implement. Future research should look at the impact of these factors and their effects on spending in greater detail. This dissertation does not completely ignore the sub-national differences between countries, however. In Chapter IV the percent of national, state, or local level fiscal and management decision-making related to schools is incorporated into models analyzing how spending impacts student outcomes.

Another area for future research is the impact of international investments on spending decisions. Most of the countries in this dataset are wealthy and only four, Turkey, Mexico, Chile, and Brazil, have significant loans from the World Bank, other countries, or other international monetary funding sources. Such outside monies are known to impact policies. Chapter V in this dissertation provides a more details look via a case study into how Mexico's policies, funded in large part by the World Bank, have had an impact on student outcomes.

The next chapter of this dissertation, Chapter IV, explores how spending between supply- and demand-side policies impact student outcomes measured via a test of cognitive skill. Such tests are irrelevant, though, if students are absent from school or if students show up with an empty stomach, are sick, or do not live in a home where basic needs are met. Research shows that when family benefits do not protect children from poverty, they suffer cognitively and educationally (N. Ozawa 2004). All countries have committed some level of their budgets to families regardless of the country's level of economic development. This chapter has shown that the variation in how much spending goes to demand-side spending is greatly dependent on a country's political system and leadership ideology. The next chapter will show how these spending decisions have an impact on countries' human capital development.

CHAPTER IV

SPENDING AND HUMAN CAPITAL DEVELOPMENT

In the last chapter we saw how government institutions and leaders' political ideology at the national level have an impact on countries' spending policies. In this chapter we explore how these policies on education spending impact the development of students' marketable skills and knowledge, their human capital. As described in Chapter II, the Education Policy Index (EPI) is designed to capture the balance of a country's supply-side spending, spending that targets schools and teachers, with the country's demand-side spending, spending that is geared to families and individual students. As I have argued throughout this dissertation, both types of spending are necessary to help all students succeed academically, but their impacts on students will be different.

Supply-side expenditures are expected to affect student learning and cognitive development whereas demand-side spending is expected to increase or maintain enrollment numbers – in some cases helping students who, due to financial circumstances, might choose to forego their education altogether. While these two outcomes are highly related (students can't benefit from schools unless they are in attendance), they need to be assessed differently. To test the success of school investments (supply-side spending) across countries it is useful to look at student performance on a common test of skills and knowledge such as the Programme for

International Student Assessment (PISA) exams, whereas to evaluate the success of demand-side spending, school enrollment rates are the more useful measure.

Recall from Chapter II that the spending estimates used to create the Education Policy Index for all types of demand-side spending (EPI-A), as well as the Education Policy Index for means-tested demand-side spending (EPI-M), reflect expenditures from all levels of government – not just spending from the federal level. While I was not able to evaluate the subnational institutional and ideological influences on the spending allocation decisions themselves, I can explore whether or not the source of funds impacts the effectiveness of schools for purposes of human capital development, as well as whether or not the level of government making education policy decisions impacts student performance.[24]

The findings presented in this chapter indicate that demand-side expenditures in the aggregate (means tested and non-means-tested) do have a positive impact on enrollment rates and that this is mostly driven by the allocation of cash benefits and benefits in kind to families and students (not financial aid). Measures of cognitive skill and knowledge, results on the PISA exams, indicate that supply-side spending (spending targeting schools and teachers) has a positive impact on student performance when demand-side spending targets the most needy students. In analyses of institutional decentralization and how management decision making affects human capital development, local autonomy shows positive effects.

[24] As discussed in Chapter III, evaluating subnational institutional and political differences between each country in the dataset is an area for further research. Ten of the countries in the dataset (Australia, Austria, Belgium, Brazil, Canada, Germany, Mexico, Spain, Switzerland, and the United States) are considered federal and would provide interesting case studies in later analyses.

In **Section 4.1** the concept of human capital is introduced and discussed in terms of enrollment rates and examination scores. The impact of EPI-A and EPI-M spending on enrollment rates and examination scores are evaluated with regression models in **Section 4.2**. The variation between countries' national, regional, and local education expenditures is explored in **Section 4.3** along with differences in how schools within countries are managed. Regression models from Section 4.2 are expanded to include fiscal and management decentralization variables and the findings are presented.

Section 4.1. What Is Human Capital?

In the political science literature, when nations spend money on education (schools and teachers), the expenditure is often considered a proxy for a country's investment in human capital (Kaufman and Segura-Ubiergo 2001, Avelino, et al. 2005, Rudra 2005, Magnuson 2007). In the economics literature, human capital is understood to be an individual's accumulation of experience and personal attributes, as well as skills and knowledge (Becker and Tomes 1986, Kan and Gershuny 2006). Education systems, in addition to family and community influence, play a key role in the development of human capital as it is the main venue for teaching skills and knowledge.

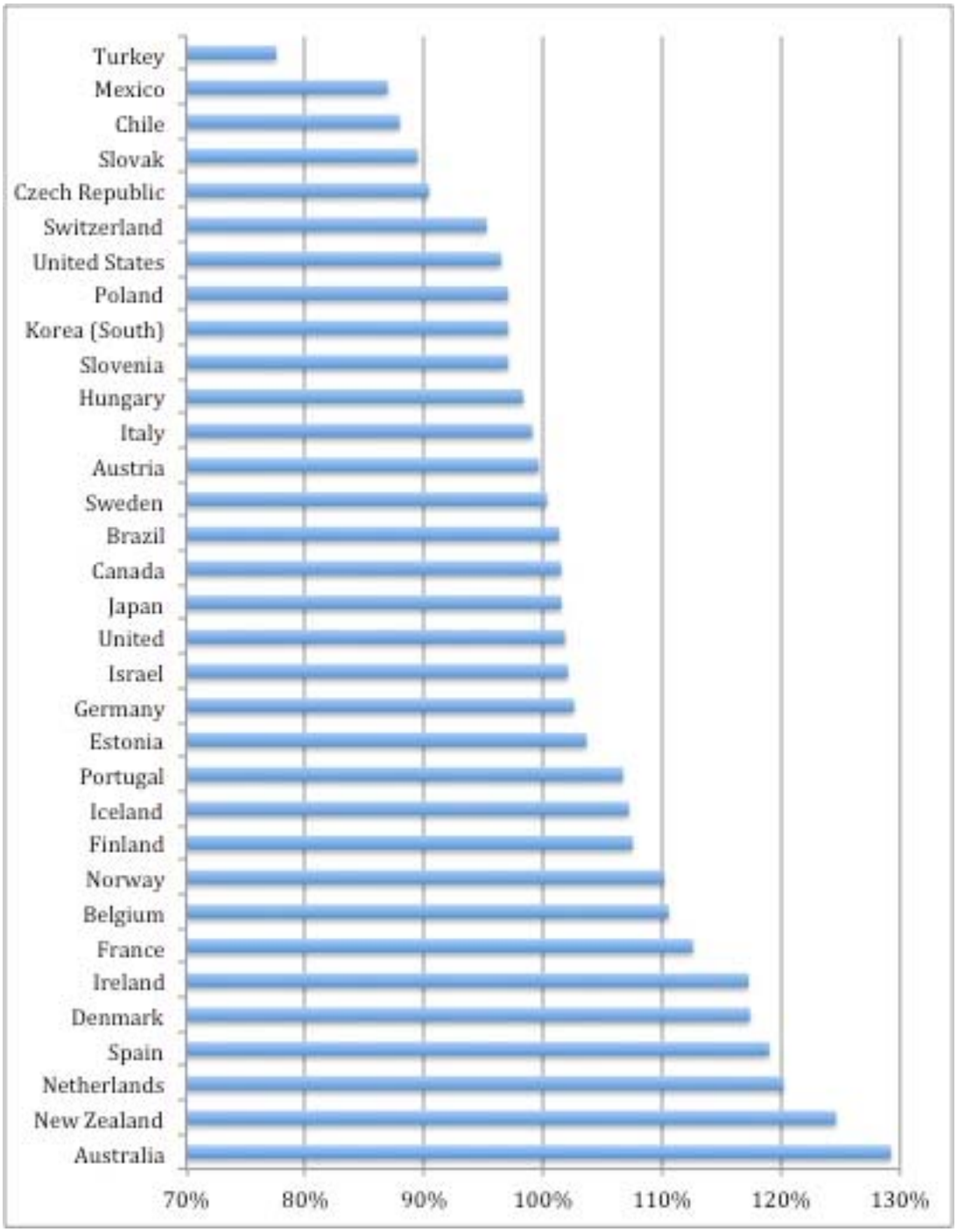
In Gary Becker's seminal 1964 book, *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education*, he explains that "education and training are the most important investments in human capital" (Becker 1962, 17). Becker goes on to discuss credentialism as an alternative to human capital analysis in which schooling is not the main contributor to one's productivity, rather one's level of

education is indicative of one's abilities, persistence, and other characteristics (19). These are not mutually exclusive conceptualizations, however. If one's credentials are indicative of how skilled and able one is to work, then educational attainment may serve as a strong proxy for one's level of human capital. Based on this logic, graduation or even enrollment rates could reasonably be used to measure a country's level of human capital. Indeed, enrollment rates can be very useful for showing how much of country's population is participating in the education system that should, depending on the quality of the school system, be enabling students to become employable members of the society.

Secondary School Enrollment and Human Capital Development

Wealthier countries tend to have high primary and secondary school enrollment rates. As shown in Figure IV-1, the countries in this dataset all have gross secondary school enrollment rates of more than 75%. The secondary gross enrollment ratio presented in Figure IV- is defined by the World Bank as the ratio of the total student enrollment in secondary school, regardless of age, to the population of the age group that officially should be enrolled in secondary school (World Development Indicators - Aggregated Database 2009). The secondary gross enrollment rate is a useful measure for assessing primary schools' effectiveness at retaining students since students cannot be in secondary school without first successfully completing the previous grades.

Figure IV–1. **Secondary School Gross Enrollment Rates, 2009***



*Due to missing 2009 data, the enrollment estimates for Brazil and Canada are from 2008
SOURCE: World Bank, UNESCO Institute for Statistics, "World Development Indicators"

The majority of the countries on this list have gross secondary enrollment ratios of around 100%, with only Turkey, Mexico, Chile, and the Slovak Republic with ratios under 90%.[25] Students are dropping out after middle school in these countries, if not before, and the potential human capital gains from supply-side education spending are consequentially lost on them. Countries that have a ratio over 100 appear to be dealing with higher rates of grade repeaters, younger students entering grades, older students returning to high school, or an immigrant population.

Policies that target the poor or that alleviate the costs of sending students to school in the first place are advantageous for keeping the school-aged population in classrooms. For the wealthy countries in the dataset used in this dissertation, demand-side spending would be expected to maintain the high enrollment ratios these countries report. For the countries that are struggling to keep their students in school, more demand-side spending would be expected to help raise enrollment levels so that students have the potential to develop the skills they will need to be economically competitive.[26]

[25] The World Bank (2009) reports that the average enrollment ratio for the world's countries in 2009 is 68% with a low of 12% in Niger. Less developed, highly illiterate countries offer interesting opportunities for exploring the impact demand-side spending can have on enrollment ratios over time, but detailed data are not currently available for these countries. In Chapter V of this dissertation, students from three rural Mexican schools provide evidence that demand-side spending can be influential for attendance decisions in places where enrollment is more of a challenge.

[26] The percent change in gross secondary enrollment rates between 2006 and 2009 in the aggregate is less than 3% with some notable exceptions – Australia (-13%), Portugal (10%), and Turkey (-9%). The causes for enrollment changes are not always related to school expenditures. Australia and Portugal were still in the 100% or higher range so changes may be due to fewer older or younger students being enrolled. Turkey's decline (from 85% to 78%) may be due to the worldwide recession but a country-specific analysis would be needed to discern the causes for this change. While demand-side spending may have played a role in moderating these changes the other factors that may be contributing to the change cannot be accounted for at this level of analysis. Accordingly, to avoid these exogenous factors, the 2009 gross enrollment rate is used.

Hypothesis 4.1: Demand-side spending should have a positive impact on countries' student enrollment rates.

The sociology literature considers human capital to be one of three types of attributes an individual may possess. In agreement with economists, sociologists consider human capital to be the skills, knowledge, and educational attainment of individuals that is considered of value for employment purposes. Social and cultural capital, however, are also part of an individual's assets. Sometimes they are integrated and together form an individual's capital, and in other studies one type of capital may influence another (Kan and Gershuny 2006; Coleman 1988). For example, Coleman (1988) argues that social capital, the connections people have with each other in a society, can be understood to build human capital by its influence on keeping students in school; his study focuses on high school. This approach is in line with economists in that education attainment is a key determinant of human capital. The third type of personal capital found in the sociology literature is cultural capital or "specific knowledge related to the participation in, and enjoyment of, the various forms of consumption in the society" (Kan and Gershuny 2006, 2). The literature indicates that these distinct types of capital, cultural, social, and human, together are critical for understanding the capabilities of individuals in a population.

Usually the economists' approach is found in the political science literature. Hershberg (1996), in his evaluation of the challenges facing America, defines human capital as "the education, skill level, and problem-solving abilities that will enable an individual to be a productive worker in the global economy of the twenty-first century"

(44). Given the similarities in how economists, sociologists, and political scientists define "human capital," for purposes of the dissertation, the definition of human capital will be those skills and abilities of the working population that have economic value.[27]

What determines, however, which skills and abilities actually have a market value? Moreover, how much of these skills and abilities can be attributable to what happens in schools? Some students have the will, financial resources, and ability to pursue general, higher-level degrees after secondary school while others choose a vocational school or directly enter the labor market. The variation in skills and occupations is vast. There is a literature that explores the connection between jobs and skills and their relationship to education (Hartog 2000b, Hartog 2000a, Webbink and Hartog 2004, Hartog and Vijverberg 2007). Webbink and Hartog (2004) go so far as to claim that "expectations of earnings lies at the heart of the 'human capital' model. The model states that students, in deciding on the amount of education, compare the outcomes of the different options and choose the option with the highest return" (103). This study found that in the Netherlands, students' expectations (both at the individual and group level) were realistic – and the underlying premise was that more education would yield higher earnings. For some jobs, workers may be over or under educated and the right mix of skills may be difficult to ascertain. Studies have looked at how to resolve this via better curricula (Hartog and Vijverberg 2007).

[27] Economic value in this definition implies an open-market value. Yet, academic knowledge, for example, does not necessarily have a general application that would make it marketable; however, the accumulation of knowledge is generally considered an important societal benefit. The employment of professors does indirectly imply a value for such activity so the value of knowledge would be included. The other concern with this definition is that it implies that monetary value is the only value that matters in a society. Cultural or social capital is also valuable, but unfortunately more difficult to measure since they are less tangible than employment.

The studies that look at human capital development over time can best identify the causal mechanisms at work from school to family to community (Goldstein 2004). While the most comprehensive (and expensive) studies would be able to trace causality by evaluating, over time, the ways education or schools impact students' human capital development (and control for the social and cultural capital a student has access to through their families and their communities), this is not always feasible or realistic; following students throughout their academic and professional careers takes generations of researchers and time. To begin to tap into what is going on in schools, however, I do survey graduating middle school and high school students in Chapter V. In these surveys, students are asked to articulate their academic and professional expectations and assess how successful their school has been for them given their family and economic circumstances. By looking to their assessment of how much school has helped them develop their human capital, the impact of school and the resources they have benefitted from can be understood at a more individual level. For cross-country analysis, though, such an analysis is not feasible. Rather, at this level, an analysis of human capital that uses a consistent and reliable multiple country assessment of cognitive skills is more appropriate.

According to Hanushek and Woessmann (2011) there are many advantages to this approach: "First, it captures variations in the knowledge and ability that schools strive to produce and thus relates the putative outputs of schooling to subsequent economic success; Second, by emphasizing total outcomes of education, it incorporates skills from any source – families, schools and ability; Third, by allowing for differences

in performance among students with differing quality of schooling (but possibly the same quantity of schooling), it opens the investigation of the importance of different policies designed to affect the quality aspects of schools" (433-34).

The Programme for International Student Assessment and Human Capital Development

The Programme for International Student Assessment (PISA) is an assessment that has been administered by the Organisation for Economic Co-operation and Development (OECD) to 15-year-olds in over 40 countries every three years since 2000. The PISA method is designed to measure a yield of student learning at age 15, so the results should indicate how well students are able to apply their knowledge and skills in mathematics, science, and reading to real-world problems. PISA features an "innovative concept of 'literacy', which refers both to students' capacity to apply knowledge and skills in key subject areas and to their ability to analyze, reason and communicate effectively as they pose, interpret and solve problems in a variety of situations" (OECD 2010e, 17). Given the learning tested by this assessment, and the contribution to learning schools are expected to contribute to students' development, supply-side spending, spending going directly to teachers and schools, would be expected to positively contribute to student performance.

Hypothesis 4.2: Supply-side spending will have a positive impact on PISA scores in all subject areas

The OECD has done a careful job to construct and translate their test items as well as implement the exams along with surveys that were administered to principals, students, and students' families (OECD 2012d). For example, each item has two different source languages (English and French) and each of these versions are translated twice into the participating country's language. A third person then reconciles the translations. This double translation approach provides multiple opportunities to resolve any semantic differences that would make the questions incomparable between countries or misunderstood within the testing country.

While PISA resources are not limitless, test questions are developed with considerable care and review. Input from participating countries is part of the item development process and questions are extensively pilot-tested. In every country where the PISA exam is implemented, there is a National Project Manager whose responsibilities include coordinating exam question proposals and the review of all test items, as well as test and survey implementation. To guarantee a representative sample of a country's schools and population demographics (the target population), the National Project Managers establish a profile of the country's education system and set the appropriate criteria for the categories of schools. A minimum of 150 schools has to be included in the implementation of the exam, and at least 35 students at each school are randomly selected to avoid selection bias (each country has to have at least 4,500 students participating). The PISA Consortium that oversees the PISA exam

implementation makes the final school selections (not the National Project Managers) to assure that random selections are made.[28]

Some have argued that even with the care taken to create the PISA exam, it is still a test that only assesses how well students can take the PISA exam. "PISA gives a relatively reliable assessment of 'knowledge and skills for PISA', that is, of how well students exercise competence within the PISA focus areas in one—and only one—'real life' situation, the PISA test situation" (Dohn 2007, 14). Standardized tests in general have come under a great deal of criticism for decades.[29] In the United States, Peter Sacks wrote in his book *Standardized Minds: The High Price of America's Testing Culture and What We Can Do to Change It* (1999) that "standardized test scores tend to be highly correlated with socioeconomic class … and standardized tests reward passive, superficial learning, drive instruction in undesirable directions, and thwart meaningful educational reform" (8). As discussed in Chapter II, the first criticism has validity – wealthier students tend to do better on these assessments, including the PISA exam. However, this does not negate the utility of using standardized assessment to gauge student learning. By looking at how disadvantaged students perform given a set of criteria that can help them do better and overcome obstacles, it is possible to innovate new reforms and interventions, such as more demand-side expenditures or better supply-side targeting.

[28] Japan is the only country whose National Project Manager oversaw the school selection because of "reasons of confidentiality" but there was careful oversight to assure that there was not bias in which schools were chosen (OECD 2012e, 71).

[29] Universal tests of mental intelligence are sometimes traced back to the early 1900's with the work of Frenchman Alfred Binet and his Binet-Simon scale (the precursor of the Stanford-Binet Intelligence Scale or what we call today the IQ test). In the over 100 years since these tests were created they have been highly criticized for their cultural and social biases, and many of these same critiques have been applied to modern standardized tests of knowledge.

This argument accepts that scoring well on tests such as the PISA exam is the desirable end-goal for systems of education. Given the economic advantages higher scores yield, it does seem that scoring better on the PISA assessment helps advance the development of human capital as defined in this dissertation (the possession of marketable skills and knowledge), making this objective a worthwhile one (Woessmann and Hanushek 2012).

Though PISA is in the end just a test, it is the leading tool to assess cross-nationally how well students "can use their knowledge and skills to solve real world problems rather than a test of whether they remember specific points of grammar or a formula to solve a physics problem" (Sahlberg 2006, 282). As such PISA developers claim that they avoid testing any one curriculum, rather, they argue it is a "forward-looking" exam that asks students to show "what [they] can do with what they learn at school" (OECD 2012e, 22).

In 2009, PISA was administered in 34 OECD countries and 41 partner countries and economies. Table IV-1 lists the countries included in this dissertation along with their 2009 PISA scores in reading, math and science. Unfortunately, PISA does not distinguish between government-dependent private schools and regular private schools so scores are only reported for private and public schools.[30]

[30] The principals of all schools that participate in the PISA exam are surveyed and asked to identify if their school is considered a "private" or a "public" school. Sometimes a principal's classification will put a government-dependent private school in the public school category, and sometimes it will go in the private school category. Based on these responses, and the scores of the students associated with these schools, a score for each school type is established. There is an "other" school category but these do not include government-dependent private schools and, if it is not zero, is a very marginal percent of the country's tally. See Appendix A for these details.

Table IV–1. Country PISA Scores

						2009 PISA Scores**		
Country	**% Public**	**% Government-Dependent Private**	**% Public and Government-Dependent Schools**	**% Private Schools***	**PISA Scores Source**	**Reading**	**Math**	**Science**
Netherlands	30%	70%	100%	0%	All Schools	508	526	522
Belgium	44%	56%	100%	0%	All Schools	506	515	507
Hungary	89%	11%	100%	0%	All Schools	494	490	503
Austria	92%	8%	100%	0%	All Schools	470	496	494
Slovakia	92%	8%	100%	0%	All Schools	477	497	490
Sweden	92%	8%	100%	0%	All Schools	497	494	495
Germany	93%	7%	100%	0%	All Schools	497	513	520
Finland	93%	7%	100%	0%	All Schools	536	541	554
Czech Republic	94%	6%	100%	0%	All Schools	478	493	500
Norway	96%	4%	100%	0%	All Schools	503	498	500
Israel	100%	0%	100%	0%	All Schools	474	447	455
Australia	72%	28%	100%	0%	All Schools	515	514	527
Denmark	87%	12%	100%	0%	All Schools	495	503	499
Slovenia	98%	1%	100%	0%	All Schools	483	501	512
Iceland	96%	4%	100%	0%	All Schools	500	507	496
France	79%	21%	99%	1%	All Schools	496	497	498
Korea	83%	16%	99%	1%	All Schools	539	546	538
New Zealand	82%	14%	96%	4%	All Schools	521	519	532
Spain	70%	25%	95%	5%	All Schools	481	483	488

Table IV-I, continued

Country	% Public	% Government-Dependent Private	% Public and Government-Dependent Schools	% Private Schools*	PISA Scores Source	2009 PISA Scores** Reading	Math	Science
U.K.	80%	15%	94%	6%	All Schools	494	492	514
Chile	47%	47%	94%	6%	All Schools	449	421	447
Ireland	99%	0%	99%	1%	Public Schools	474	472	489
Turkey	98%	0%	98%	2%	Public Schools	464	444	453
Estonia	98%	0%	98%	2%	Public Schools	501	512	528
Switzerland	94%	2%	96%	4%	Public Schools	500	534	516
Poland	96%	1%	96%	4%	Public Schools	499	493	507
Italy	94%	0%	95%	5%	Public Schools	489	486	492
Canada	94%	0%	94%	6%	Public Schools	521	522	526
Portugal	87%	4%	91%	9%	Public Schools	485	482	489
U.S.A.	91%	0%	91%	9%	Public Schools	494	482	496
Japan	90%	0%	90%	10%	Public Schools	522	531	542
Brazil	89%	0%	89%	11%	Public Schools	398	373	393
Mexico	89%	0%	89%	11%	Public Schools	420	414	411

NOTES: Table II-1 also shows the percentage of public, government-dependent private schools, and private schools for each country. PISA scores are only published based on private or public schools so there is no distinction made for government-dependent private schools. The percentages of school types data are repeated here to better explain why PISA scores are based on all schools (public and private) or only public schools in the analysis in Chapter IV.

*Private schools exist in these countries even when 0% is listed but the number is negligible in the aggregate count of school types.

**A weighted mean is used to determine a combined score for all types of schools within a country. (The scores of all private school students are averaged together and then multiplied by the percent of private schools that took the PISA exam in the country. The scores of all public school students are also averaged together and then multiplied by the percent of public schools that took the PISA exam in the country. These two numbers are added together to determine the country's PISA score).

SOURCES: OECD Education Database, dataset: students enrolled by type of institutions and OECD Education Statistics Database (PISA Results 2009)

As discussed in Chapter II, about a third of the countries in this study have a significant number of government-dependent private schools (over 10%) as reported by the OECD. Accordingly, if only public school PISA scores are used, it would misrepresent the skills gained by students who are benefitting from government funding. To show how country PISA scores are determined, the percentage of public, government-dependent private schools, and private schools for each country is listed (this information is also included in Table II-1 in Chapter II).

The "PISA Score Source" column indicates if the scores used for purposes of analysis in this chapter reflects the work of students from both private and public schools or just public schools. If 100% of the schools in a country are public and government-dependent private schools, then the total country scores are used (all scores from public and private school students). If there are no government-dependent private schools in the country, then the public school scores are used. The trickiest countries are those that have a large number of government-dependent private schools *and* a fair number of private schools. In Chile, for example, 47% of the schools are public and 47% of the schools are government-dependent, leaving 6% of the population in private school. To not include the government-dependent private school score altogether would ignore 47% of the students who are benefitting from government funding. Accordingly, the overall country score is used so the 6% of schools that are private have their students included in

the PISA score used for analysis. Appendix E lists the public and private school scores for the students who completed the PISA exam.[31]

The difference in private and public school scores is reported in Table IV-2. According to the OECD, "In PISA 2009, one school year's progress corresponds to an average of 39 score points on the PISA reading scale" (OECD 2012c, 95).[32] In the aggregate, the difference between public and private school students' performance on the PISA exams averages less than one year of schooling, yet in some cases there can be as much as three years of difference in student performance. In Brazil, Slovenia, and Turkey, public schools make up respectively 89%, 98%, and 98% of the schools, and they have the largest disparities between public and private school student performance. Based on the scores, there is a two to three-year gap between private school and public school students' abilities in these countries. Moreover, in these three cases as well as in nearly all the countries in the analysis, private school students perform better on the PISA exam. Much of the disparity has been attributed to the demographic differences in students who attend public versus private schools – private school students are usually more advantaged economically (OECD 2009a). In studies however, once the socioeconomic status (SES) of students is controlled for, the gap in public and private school students' scores becomes unremarkable (OECD 2010e).

[31] While PISA administrators try to pick a representative sample of school types to participate in the PISA exam, they cannot always exactly match the distribution.
[32] The 39 points was calculated by subtracting the scores of students of the same age who were enrolled in at least two different grade levels.

Table IV–2. Gap in the PISA Score Between Public and Private Schools

	Difference between Private and Public School Scores		
Country	**Reading**	**Math**	**Science**
Australia	45	38	41
Austria	32	12	18
Belgium	45	46	45
Brazil	**118**	**112**	**112**
Canada	45	60	41
Chile	-26	-23	-22
Czech Republic	32	21	37
Denmark	17	14	20
Estonia	9	-10	1
Finland	6	-6	10
France	a	a	A
Germany	16	21	17
Hungary	15	19	14
Iceland	a	a	A
Ireland	35	25	31
Israel	-4	-4	-4
Italy	-41	-40	-37
Japan	-8	-6	-9
Korea	16	12	9
Mexico	48	43	45
Netherlands	-11	-8	-6
New Zealand	69	64	59
Norway	-38	-44	-44
Poland	55	64	56
Portugal	31	32	27
Slovak Republic	24	17	16
Slovenia	**80**	**97**	**89**
Spain	36	31	31
Sweden	35	30	29
Switzerland	18	7	13
Turkey	**82**	**127**	**92**
UK	61	56	73
USA	71	61	68
Average	**29**	**28**	**28**

NOTES: a = not applicable (France did not categorize schools and Iceland did not report private school scores). The largest differences are in bold.

Despite the limitations of standardized tests discussed above, they do provide a consistent cross-national measure with which to compare students (McBee 2002, Altinok 2008). In 2009, the central focus of the PISA exam was reading, though students were also tested in mathematics and science. OECD analyses indicate that "across OECD countries, overall performance in mathematics remained unchanged between 2003 and 2009, as did performance in science between 2006 and 2009" (OECD 2010f, 14). Reading, however, did show mixed results – some countries improved while others did not. In the aggregate, however, changes in scores between 2006 and 2009 were not substantial enough for purposes of the analysis presented here and thus only the 2009 scores are used as the dependent variable in this study. In the next section, analyses exploring how governments' spending decisions impact enrollment rates and student performance on the PISA tests of skill and cognition are presented.

Section 4.2. Human Capital and Education Investments

To begin the analysis I first want to test *Hypothesis 4.1* that claims demand-side spending will have a positive impact on enrollment rates. The gross enrollment rate of each country is the outcome of interest (the dependent variable) and lower EPI scores, scores that are closer to .5 and are more demand-oriented, would be expected to have a larger impact on enrollment rates than EPI scores that are more supply-side oriented. Thus, if demand-side spending is having the expected effect, if it is helping students get to school and stay there, then as the EPI gets lower, enrollment rates should increase making this relationship a negative one. While all of the countries in this dataset are

wealthy by international standards, five of them have a 2006 Gross Domestic Product (GDP) per capita of less than $10,000 (Brazil, Chile, Mexico, Poland, and Turkey).[33] Controlling for wealth with GDP per capita in the model is a way to account for the societal advantages wealthier countries have for students that I am not capturing in the EPI-A and EPI-M measures.[34]

Equations 4.1a and 4.2a look at the overall balance of demand- and supply-side spending while Equations 4.1b and 4.2b split apart the EPI scores to isolate the demand-side spending that is expected to influence the gross secondary enrollment rates.

$$gEnrollment_{ct} = \beta_0 + EPIA_{ct-3}\beta_1 + GDPpc_{ct-3}\beta_2 + \varepsilon \qquad \textit{eq. 4.1a}$$

$$gEnrollment_{ct} = \beta_0 + PCashBenefitsA_{ct-3}\beta_1 + PBenefitsInKindA_{ct-3}\beta_2 + PFinancialAidA_{ct-3}\beta_3 + GDPpc_{ct-3}\beta_4 + \varepsilon \qquad \textit{eq. 4.1b}$$

$$gEnrollment_{ct} = \beta_0 + EPIM_{ct-3}\beta_1 + GDPpc_{ct-3}\beta_2 + \varepsilon \qquad \textit{eq. 4.2a}$$

$$gEnrollment_{ct} = \beta_0 + PCashBenefitsM_{ct-3}\beta_1 + PBenefitsInKindM_{ct-3}\beta_2 + PFinancialAidM_{ct-3}\beta_3 + GDPpc_{ct-3}\beta_4 + \varepsilon \qquad \textit{eq. 4.2b}$$

[33] See Table II-5 in Chapter II for each country's GDP per capita

[34] Previous versions of this model used per pupil spending based on the overall EPI expenditures and enrollment rates as the control variable for wealth. Scatterplots reveal that this measure, though highly correlated with GDP per capita, misrepresents the advantages students coming from wealthier countries might have over students from less wealthy countries. For example, students in Slovenia appear to be benefitting more than students in Japan from education spending though Japanese students are considerably wealthier and have advantages the model would not otherwise be taking into account.

In Equations 4.1a through 4.2b, $gEnrollment_{ct}$ is the gross secondary enrollment ratio for each country (c) at time (t), which is 2009.[35] The $EPIA_{ct-3}$ in Equation 4.1a is the 2006 Education Policy Index for which the supply-side spending includes all monies allocated to public and government-dependent private schools in each country, and the demand-side spending is both means-tested and non-means-tested. The $EPIM_{ct-3}$ in Equation 4.1b is the Education Policy Index for which the supply-side spending is all monies allocated to schools and the demand-side spending includes only means-tested benefits (see Chapter II for details on how the EPI-A and EPI-M variables are constructed).

In Equations 4.1b and 4.2b, demand-side spending is split apart into its components: cash benefits, benefits in kind, and student financial aid. Chapter II explains how these categories are derived. The EPI-A categories for Equation 4.1b are based on the percent of overall EPI-A spending (supply-side plus demand-side spending) for each country (c) at time (t-3) or 2006 allocated to cash benefits ($PCashBenefitsA_{ct-3}$), benefits in kind ($PBenefitsInKindA_{ct-3}$), and student financial aid ($PFinancialAidA_{ct-3}$). The EPI-M categories for Equation 4.2b are based on percent of overall EPI-M spending (supply-side plus means-tested demand side spending) for each country (c) at time (t-3) or 2006 allocated to cash benefits ($PCashBenefitsM_{ct-3}$), benefits in kind ($PBenefitsInKindM_{ct-3}$), and student financial aid ($PFinancialAidM_{ct-3}$).

[35] Canada and Brazil reported gross enrollment ratios for 2008 rather than 2009. The gross enrollment ratio represents the overall enrollment for the entire country – public and all types of private schools. The source population data that counts the number of secondary-school aged citizens is not easily accessed making it difficult to determine the percent of this population subset that is going to public and government-dependent private schools. Regardless, the country's gross enrollment rate should be sufficient for analysis as it is representative of the level of the education system's hegemony.

Table IV–3. Spending and Gross Secondary Enrollment Rates

	Equation 4.1a* **	**Equation 4.1b*** **	**Equation 4.2a*** **	**Equation 4.2b** **
Dependent Variable	Gross Secondary Enrollment	Gross Secondary Enrollment	Gross Secondary Enrollment	Gross Secondary Enrollment
EPI-A, 2006	-31.9** (14.9)			
Percent cash benefits-A		38.6** (17.7)		
Percent benefits in kind-A		37.0* (21.8)		
Percent financial aid-A		6.7 (26.7)		
GDP per capita, 2006	0.0002** (.0001)	0.0002* (.0001)	0.0004*** (.0001)	0.0004*** (.0001)
EPI-M, 2006			-23.2 (17.6)	
Percent cash benefits-M				44.6 (42)
Percent benefits in kind-M				27.9 (26.7)
Percent financial aid-M				12.8 (23.3)
Constant	118*** (10.3)	85.5*** (4.64)	113*** (15.5)	89.0*** (4.74)
Observations	33	33	33	33
R-squared	0.372	0.397	0.283	0.298

NOTE: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table IV-3 shows the results from Equations 4.1a through 4.2b. The outcomes indicate that when countries spend more on supply-side expenditures (when the EPI-A increases), enrollment estimates fall. This implies that if countries allocate more money to demand-side expenditures (means and non-means-tested policies) relative to supply, enrollment numbers increase. When the demand-side expenditures are only targeting the most needy students (when they are means-tested), however, spending allocations, regardless of what they are targeting, are not having as much of an impact on enrollment numbers.

The results show that when the EPI-A categories are split apart into the demand-side spending categories, the percent of cash benefits as well as family benefits in kind has an impact on enrollment and this appears to be driving the significance of the EPI-A in Equation 4.1a (when the overall EPI-A is the independent variable of interest). Based on the adjusted R-square, we can say that nearly 40% of the variation in the enrollments in Equation 4.1b can be explained by the cash benefits and family benefits in kind expenditures.

There are no statistically significant findings for the EPI-M categories implying that when benefits are generous to everyone, there is more general support for students to go to school, and they go. Since GDP per capita is significant in all of the equations, the enrollment numbers may also be a reflection of the fact that in wealthier countries going to school is the norm and not going is the exception.

The point of school, however, is not just to show up. School is supposed to teach students new knowledge and then how to apply that knowledge. As students work their

way from primary through to secondary school, their knowledge and skills should be developing. By the time students are in secondary school, their cumulative knowledge becomes the younger population's human capital, and in this study this capital is measured by student performance on the 2009 reading, math, and science PISA exams. *Hypothesis 4.2* asserts that supply-side spending in particular will positively impact student performance on the PISA exam in all subject areas (reading, math, and science). To begin to test this assertion, countries' 2006 EPI-A and EPI-M scores, the balance of supply- and demand-side spending, are the independent variables of interest. Since the PISA exams are administered every three years, I applied a three-year lag to gauge the success of policies implemented at the time of the last exam (2006) that may have an impact on current (2009) scores. Students in secondary school in 2009 would have been in school in 2006 so they would have had three years to benefit from advances in school quality or from access incentives policies provide.

Unfortunately, the issue of school quality is not captured in the EPI – spending on teachers does not mean that the teachers are effective at teaching, nor does spending on materials or capital expenditures guarantee that anything meaningful is being transferred to students. The PISA scores themselves, however, may be indicative of the quality of the schools – if students are able to perform well on these tests they must be prepared and the expectation is that the school contributed to this outcome in some way.[36] Gross enrollment ratios for each country are used as a control for the level of

[36] As mentioned in Chapter III, teacher unions could be protecting teachers at the expense of quality learning, keeping bad teachers employed who are not helping students gain useful knowledge or skills. However, the "power of unions" variable used in Chapter III, when incorporated into models of human capital development, did not add any significance and proved to be an extraneous variable. Tapping into

student participation in the country's school system (how popular going to school is for the general population) and GDP per capita is used to control for the country's wealth and all of the advantages that wealth brings to human capital.

$$\text{Human Capital}_{cts} = \beta_0 + \text{EPIA}_{ct-3}\beta_1 + \text{GDPpc}_{ct-3}\,\beta_2 + \text{gEnrollment}_{ct}\beta_3 + \varepsilon \qquad \textit{eq. 4.3a}$$

$$\text{Human Capital}_{cts} = \beta_0 + \text{EPIM}_{ct-3}\beta_1 + \text{GDPpc}_{ct-3}\,\beta_2 + \text{gEnrollment}_{ct}\beta_3 + \varepsilon \qquad \textit{eq. 4.3b}$$

In Equations 4.3a and 4.3b, $\text{Human Capital}_{cts}$ is the public and government-dependent private school students' scores on the PISA exams for each country (c) at time (t), 2009, in subject (s) – reading, math, or science. The control variables are the per-pupil spending and enrollment variables from Equations 4.1 and 4.2.

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the impact of teacher unions on human capital development is an interesting question and future research should address this topic more intensely, however, it is currently outside the scope of this dissertation.

Table IV–4. Spending and Student Performance on the PISA Exam

	Equation 4.3a**	Equation 4.3a**	Equation 4.3a**	Equation 4.3b***	Equation 4.3b***	Equation 4.3b***
Dependent Variable	Reading Scores	Math Scores	Science Scores	Reading Scores	Math Scores	Science Scores
EPI-A, 2006	60.7 (38)	60.5 (49.9)	45 (47.7)			
GDP per capita, 2006	0.0007** (.0003)	0.001** (.000)	0.001 (.000)	0.0004 (.0003)	0.0007* (.0003)	0.0004 (.0004)
Gross enrollment 2009	0.96* (.49)	0.91 (.65)	1.03 (.62)	0.88* (.44)	0.86 (.58)	1.02*(.56)
EPI-M, 2006				105** (43.7)	118** (57.6)	97.9* (55.4)
Constant	331*** (64.6)	329*** (84.6)	342*** (80.9)	295***(62.5)	278*** (82.4)	293*** (79.3)
Observations	33	33	33	33	33	33
R-squared	0.32	0.30	0.25	0.37	0.34	0.29

NOTE: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The results in Table IV-4 indicate that when countries spend more on supply-side policies, students have higher PISA scores – when the demand-side policies are means-tested. When spending includes all types of demand-side spending (EPI-A), the model is significant (p<.05) for each subject but GDP per capita or enrollment are the variables that are explaining about 30% of the variation in students' reading and math scores. According to the OECD, "GDP per capita influences educational success, but this only explains 6% of the differences in average student performance. The other 94% reflect the potential for public policy to make a difference" (OECD 2010b, 3). This average finding understates the impact of wealth in the countries included in this dataset.

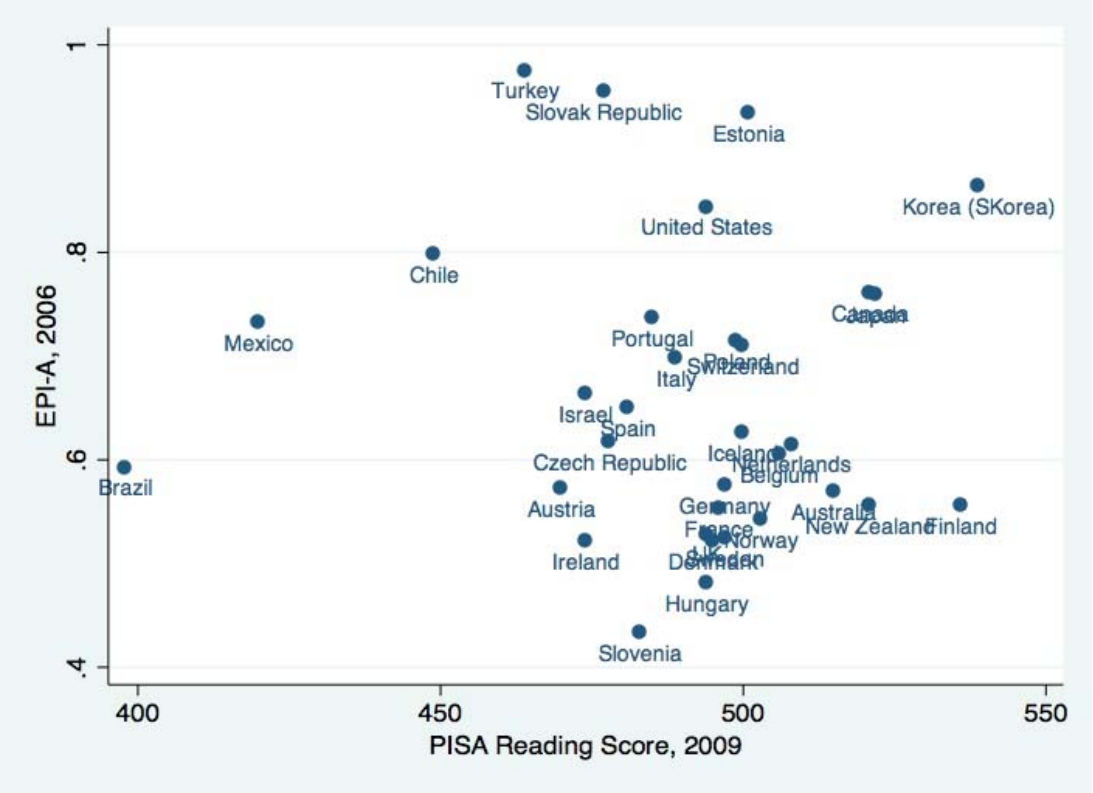
When spending includes only means-tested demand-side spending (EPI-M), the model is even more significant ($p<.001$) for reading and math outcomes, and supply-side spending increases positively correlate with all subjects tested on the PISA exam. This is remarkable since these EPI-M policies are targeting the most needy students and their families and their inclusion in school is not lowering country PISA scores, rather they seem to be positively influencing the overall scores. This could imply that the demand-side spending has been incentivizing less advantaged students to go to school and to prioritize their education, and that the supply-side spending may be effectively helping students succeed academically. This could also imply that fewer disadvantaged students are getting benefits and going to school in the first place so they are not having a negative impact on PISA scores. In countries where enrollment rates are low this concern warrants further investigation. However, in this dataset the enrollment rates are high implying that most students are attending schools and participating in the system.

The impact on test scores based on the EPI-M balance of spending shows that by increasing supply-side spending, students can gain three years of academic benefits in math (118 points), and over two years of academic benefits in reading and science if a year is equivalent to 39 points (See Table IV-4). A scatterplot of PISA 2009 Reading scores to EPI-M (Figure IV-2) show that the spending balances of some countries such as Turkey, Belgium, and S. Korea have comparable EPI-M scores but S. Korea has significantly better scores on the PISA Reading exam.

Figure IV–2. EPI-M Scores to PISA Reading Scores

A scatterplot of PISA 2009 Reading scores to EPI-A (Figure IV-3) shows a similar pattern – that countries with highly skewed supply-side spending do not necessarily yield impressive test results.

Figure IV–3. EPI-A Scores to PISA Reading Scores



One underlying question is where is the supply-side spending going that *is* having the impact on the scores? Equations 4.4a and 4.4b split apart the supply-side EPI-A and EPI-M scores into their components to better understand which specific types of supply-side spending are impacting student performance levels.

$$\text{Human Capital}_{cts} = \beta_0 + \text{PCompensationA}_{ct-3}\beta_1 + \text{PNonCompensationA}_{ct-3}\beta_2 + \text{PCapExpA}_{ct-3}\beta_3 + \text{GDPpc}_{ct-3}\beta_2 + \text{gEnrollment}_{ct}\beta_3 + \varepsilon \qquad \textit{eq. 4.4a}$$

$$\text{Human Capital}_{cts} = \beta_0 + \text{PCompensationM}_{ct-3}\beta_1 + \text{PNonCompensationM}_{ct-3}\beta_2 + \text{PCapExpM}_{ct-3}\beta_3 + \text{GDPpc}_{ct-3}\beta_2 + \text{gEnrollment}_{ct}\beta_3 + \varepsilon \qquad \textit{eq. 4.4b}$$

In Equation 4.4a, the supply-side spending components are the percent of overall EPI-A spending (supply plus demand-side expenditures) allocated to teacher compensation (PCompensationA) for each country (c) at time t-3 or 2006, the percent of overall EPI-A spending allocated to non-compensation benefits (PNonCompensationA), and the percent of overall EPI-A spending allocated to capital expenditures (PNonCompensationA). In Equation 4.4b, the supply-side subcategories are the same compensation, non-compensation, and capital expenditures, but the percentages are based on the EPI-M (supply plus means-tested demand-side spending). The results of these equations are presented in Table IV-5.[37]

[37] Chapter II explains how these components are calculated.

Table IV–5. Supply-Side Spending and Student Performance on the PISA Exam

	Equation 4.4a**	Equation 4.4a*	Equation 4.4a*	Equation 4.4b***	Equation 4.4b***	Equation 4.4b***
Dependent Variable	Reading Scores	Math Scores	Science Scores	Reading Scores	Math Scores	Science Scores
% Teacher compensation - A	43.1 (49.6)	30.0 (65.7)	-2.05 (62.2)			
% School Services - A	100 (102)	132 (135)	81.8 (128)			
% Capital expenditures - A	403 (238)	356 (315)	444 (298)			
GDP per capita 2006	0.0007* (0.0004)	0.001* (0.0005)	0.001 (0.0005)	0.0003 (0.0003)	0.0006 (0.0004)	0.0001 (0.0004)
Gross enrollment 2009	0.69 (0.58)	0.53 (0.76)	0.56 (0.72)	0.36 (0.47)	0.27 (0.63)	0.42 (0.60)
% Teacher compensation - M				108** (45.7)	119* (61.4)	87.7 (58.9)
% School Services– M				141* (73.2)	182* (98.4)	149 (94.4)
% Capital expenditures –M				462** (178)	451* (240)	483** (230)
Constant	343*** (77.0)	358*** (102)	387*** (96.5)	318*** (60.8)	309*** (81.8)	328*** (78.4)
Observations	29[1]	29[1]	29[1]	29[1]	29[1]	29[1]
R-squared	0.40	0.34	0.32	0.51	0.44	0.41

NOTE: Standard errors in parentheses

[1] The omitted countries due to missing data are: Chile, Estonia, Hungary, and New Zealand (unlike their demand-side data, these countries do not disaggregate their supply-side data)

*** p<0.01, ** p<0.05, * p<0.1

Since the EPI-A in Equation 4.3a did not yield any significant results we would not expect any of the EPI-A supply-side spending categories to have an impact on student outcomes. Accordingly, only GDP per capita has significance when Equation 4.4a is tested. Equation 4.4b uses means-tested demand-side policies only and the results show that Capital Expenditures-M is the most significant supply-side spending category across all subjects. Science appears to benefit the most from these expenditures though it is not clear that laboratories or other facilities that might impact these scores are being built with these funds. With more detailed data showing where the capital expenditures are in fact going, it would be possible to better explain why the spending is having positive impacts on each of the subject areas.

One question to consider from this analysis is what does means-tested demand-side spending by itself tell us? To really assess the effectiveness of means-tested demand-side spending, as opposed to all demand-side spending, I looked at the proportion of demand-side spending that is means-tested.[38] Figure IV-4 shows student PISA reading scores (2006) and the proportion of demand-side spending that is means-tested. Means-tested spending as a percent of all demand-side spending is *not* in fact helping student scores, though, as we saw in Chapter I, it does help get students to school. This finding indicates that attracting students to school who would otherwise not be there is not, on its own, going to help student test scores. Rather, the experiences students have at school are going to be more of the driving factors for improving test

[38] This proportion is calculated by dividing the total means-tested demand-side spending by total demand-side spending.

scores. As discussed in Chapter I, school investments do positively correlate with how resilient the poorest students are in each country that participated in the PISA exams.

Figure IV–4. Proportion of Means-Tested Demand-Side Spending and PISA Scores

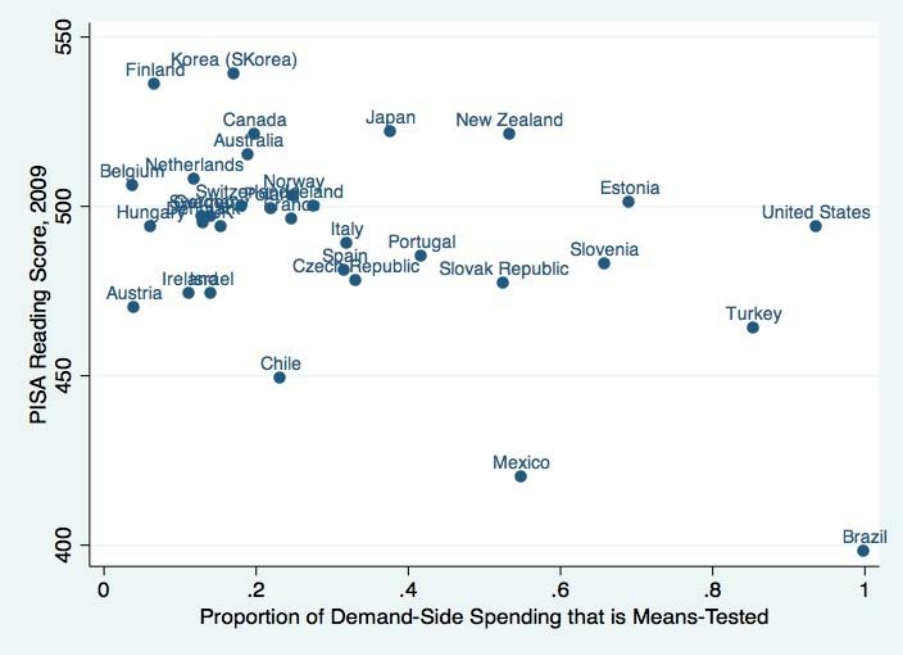
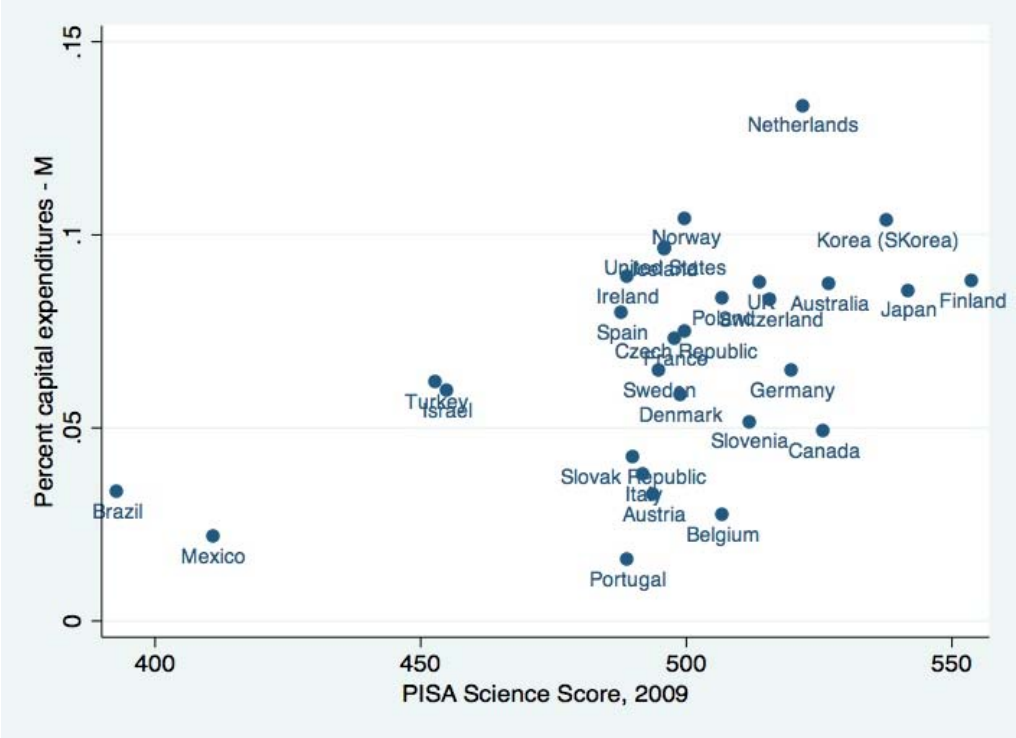


Figure IV-5 shows that, when considering education spending to be money spent on schools and means-tested demand-side policies, no country spends more than 15% of their education expenditures on infrastructure (capital expenditures) and the Netherlands, Norway, and South Korea are leading the countries in the dataset by spending over 10% on these types of expenses. The level of investment by these countries raises questions around what is being purchased with this money that is so significantly impacting student outcomes.

Figure IV–5. Percent Capital Expenditures - M and 2009 Science PISA Scores



The percent of teacher compensation based on the EPI-M expenditures is another area of spending that benefits student scores in reading and math. This result confirms the importance of teachers, especially when the most disadvantaged students are benefitting from policies that are encouraging them to come to school. Though it is not possible to determine if this spending is for more teachers or paying teachers more (or something else) it does encourage a closer look at how teachers are being compensated and which practices are producing this effect. Non-compensation spending is also significantly correlated with higher PISA scores in reading and math. As the demand-side spending becomes more targeted, students appear to be benefitting more, indicating that helping

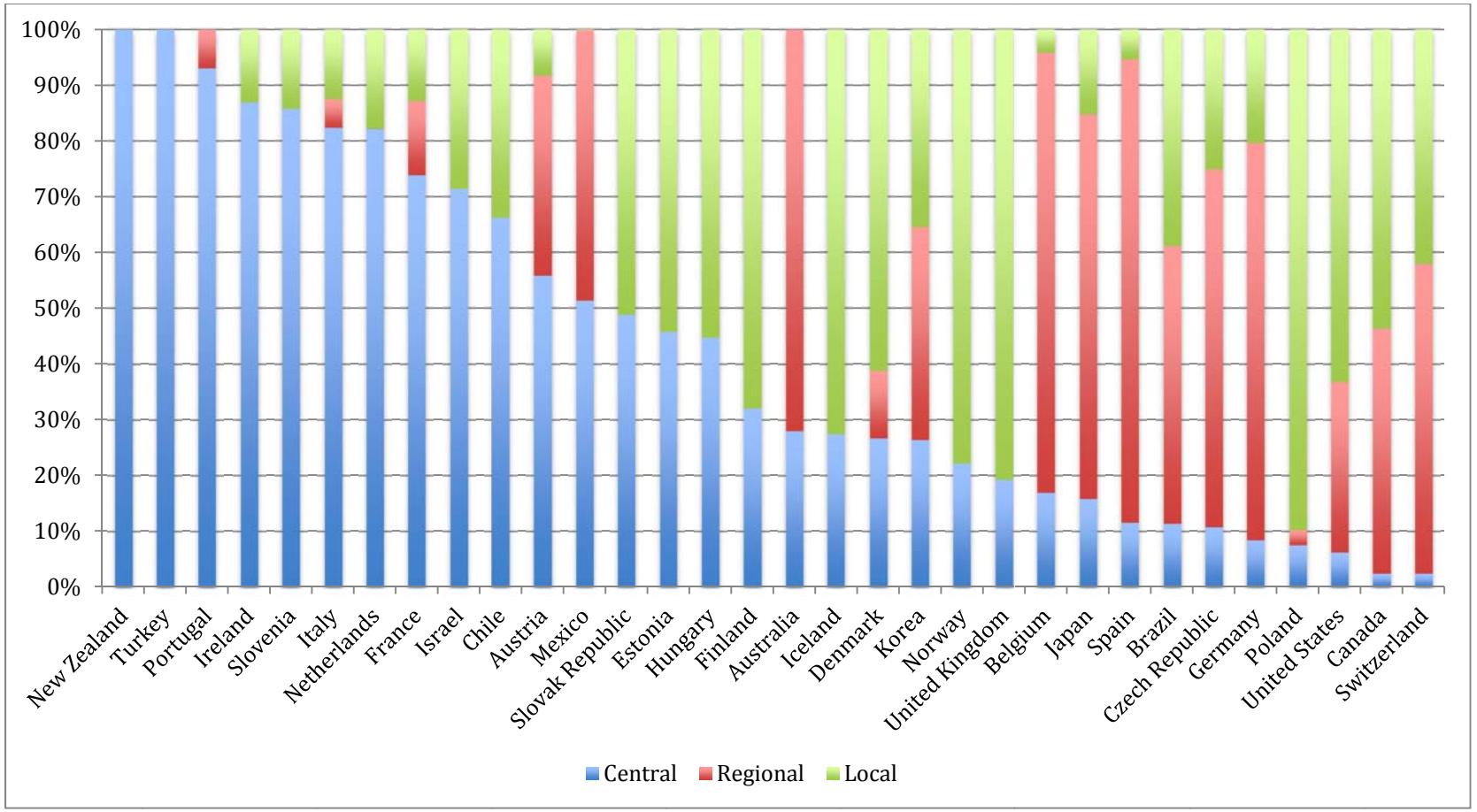
the most disadvantaged families does have an impact on education spending effectiveness overall.

Section 4.3. Expenditure Sources and Decision Making In Education Spending – Do They Impact Human Capital?

Research has shown that institutional elements such as decentralization and school autonomy incentivize schools and teachers, and this leads to higher student achievement (Woessmann and Hanushek 2012, 432). To this end, perhaps where the money is coming from – which level of government is funding education – and where school management decisions are being made will make a difference for student performance on tests of knowledge and skill.

The funding sources for the supply-side spending portion of the EPI-A are highly variable across countries. The UNESCO-OECD-Eurostat (UOE) data compiled from reporting countries' ministries of education or national statistical offices are shown in Figure IV-6 and includes monies transferred between levels of government.

Figure IV–6. Percentage of Supply-Side Expenditures from Each Level of Government, 2006



NOTE: Sweden did not provide any expenditure data
SOURCE: OECD Education Dataset: Expenditure by funding source (OECD 2012a)

Some countries, like New Zealand, Portugal, and Italy, rely primarily on their central government for their education monies. Countries like Australia, Belgium and Mexico, however, rely more heavily on regional governments (though the central government may still be directing much of the budget allocations, as in Mexico) and finally, countries such as Finland, Poland, and the United Kingdom mainly rely on local government revenues.[39]

To see how much the level of government expenditures impacts student performance on the PISA exams, the percent of local government spending was added as an independent variable to Equations 4.3a and 4.3b. These regression models (not shown) were significant but the local spending variable was not significant, and the results from the earlier regression analysis held even with fewer degrees of freedom. This outcome reconfirms that supply-side spending relative to means-tested demand-side spending significantly impact student test scores regardless of the source of the money.[40]

Does Decision-making Decentralization Matter for Human Capital Development?

Finland, a country with the highest science 2009 PISA score in the dataset, and the second highest math and reading scores after South Korea, has had its students place in the top five on the PISA exams in all subjects since the test was first implemented in 2000. Finland has a strong commitment to equitable education opportunities and its EPI-

[39] This dissertation does not address taxation issues associated with education and social expenditures, nor does it address how much private investment goes into public and government-dependent private schools. While these factors are germane to the discussion, only actual government expenditures and their institutional source is under analysis in this dissertation.

[40] The percent of central spending expenditures was also used as an independent variable and the scenarios were consistent – *where* supply-side monies were coming from was insignificant whereas the amount of supply-side spending was significant, especially when the EPI-M measure was applied.

A score of .56 reflects its welfare state status. Fairly balanced between supply- and demand-side spending, Finland spends 55% of its budget on schools and 45% of its budget on individual students and families. Most of Finland's spending, 33%, goes to personnel expenditures and its next biggest expenses are cash benefits (23%) and then benefits in kind (20%). Only 5% of Finland's supply-side spending goes towards capital expenditures (see Table II-2 in Chapter II for the EPI-A category details).

Finland is committed to providing students with access to its schools and has done a good job providing quality schools once all students are there. Primarily locally funded, 93% of Finland's schools are public and the remaining 7% are government-dependent private schools (the private schools were so heavily subsidized that they eventually became part of the public school system). These schools, called *peruskoulu*, are comprehensive schools for students in grades 1 to 9. They provide a common curriculum, health and dental services, hot meals, and mental health services to all students regardless of need. There is also ongoing assessment of students that are used formatively – to mark where teachers need to target lessons. Once students complete this level of education they go onto high schools that select students based on their academic performance.

With its success, the Finnish school system has become a model for countries around the world and the autonomy Finland gives its schools has been of great interest to those advocating decentralized school management. In fact, there has been a substantial move to empower schools through what is called Schools-Based Management (SBM) because "most countries whose students perform well in international student

achievement tests give their local authorities and schools substantial autonomy over adapting and implementing educational content, allocating and managing resources, or both" (Barrera-Osorio, et al. 2009, 6). Research based on the PISA exams and associated surveys suggest that budget autonomy for schools has a negative impact on student success but management decisions, such as the hiring of teachers, can have a positive impact on student cognitive skills (Woessmann, et al. 2009).

To discern how much autonomy schools enjoy over their resources, curriculum, and personnel, the OECD Education group has administered a "Survey on Decision-Making" every four years since 2003. A panel of national experts on lower secondary education from each participating country is created to respond to these surveys and the panels are designed to have representation from each of the government decision-making levels (the central government, middle governments, and individual schools). The group is supposed to form a consensus on responses to each question when they are completing the survey (OECD 2012c, 4-6).

The surveys are broken up into four categories or indicators: organization of instruction, planning and structures, personnel management, and resource management. Organization of instruction questions ask panels to indicate which level of government makes decisions related to curricula, pedagogy, tracking (if applicable), and essentially anything related to teaching and learning decisions in the classroom. Planning and structures questions include the overall design of programs of study, credentialing, and school closures or openings. Personnel management includes hiring, firing, and salary

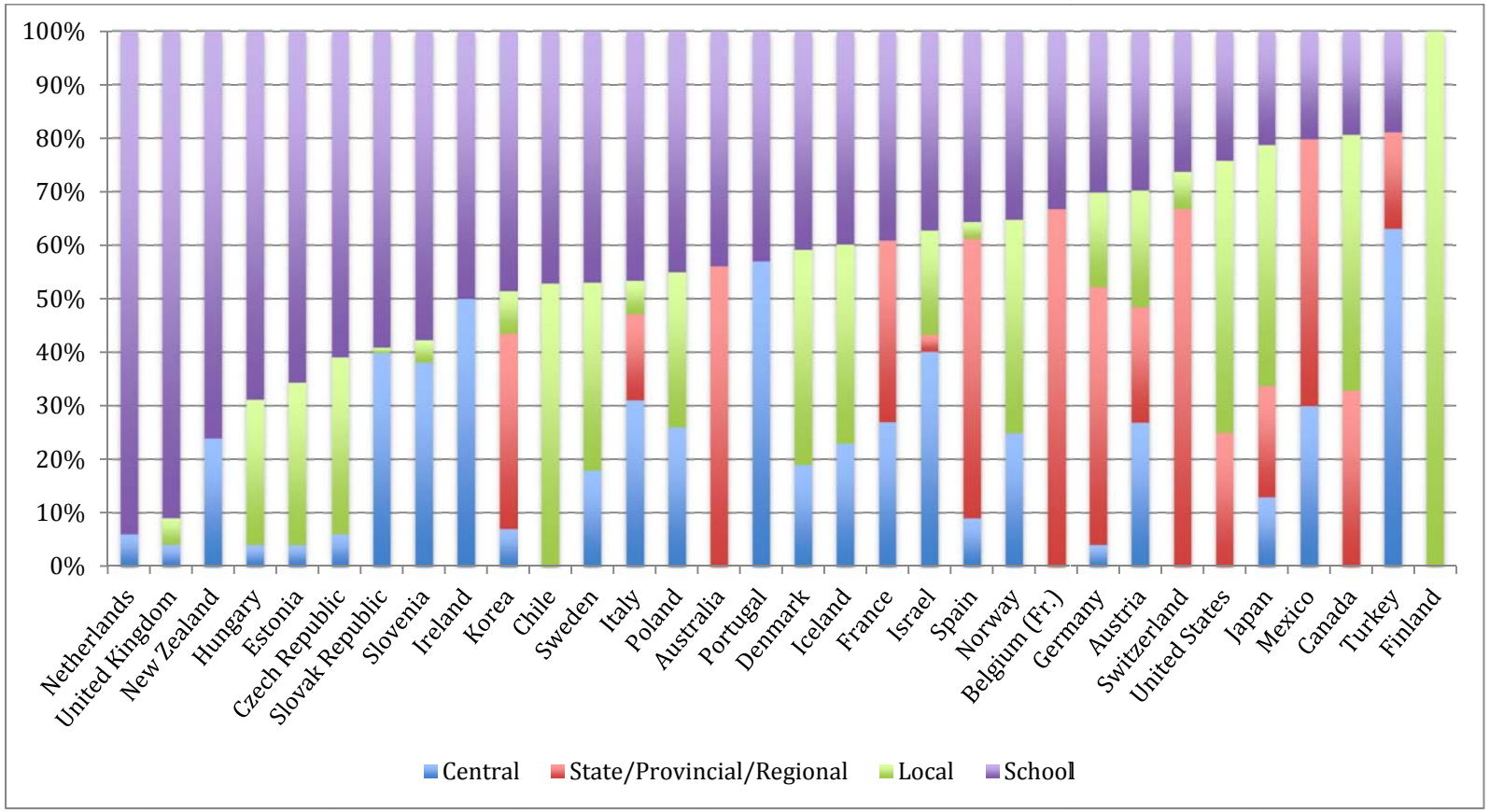
decisions whereas resource management involves anything related to resource allocation (budgeting decisions).

To get a general understanding of which level of government makes decisions for each country's education system, the four indicators are merged into an aggregated measure of education decision-making. The compiled measure brings all the factors together by making each decision-making category worth 25% of the total measure and weighting each question within each category accordingly. Figure IV-7 shows the overall trends for which level of government makes what percentage of the decisions in public lower secondary education in each country.[41]

No country has the central government making more than 65% of the education decisions and only Turkey, Portugal, and Ireland have the central government making 50% or more of the decisions. In Finland all of the decisions are made locally while in the United States 25% of decisions are made at the state level, 51% of decisions are made at the local level, and 24% are made at the school level.[42]

[41] The original data listed five levels of government: central, state, provincial/regional, sub-regional or inter-municipal authorities or governments, local authorities or governments, and schools, school boards, or committees. The state, provincial/regional, and sub-regional (which only applies to France) categories were merged to represent a subnational level below the federal level but above the local and school levels.
[42] In the United States, the federal Department of Education can try to incentivize states to follow policy initiatives such as the 2001 No Child Left Behind Act, but it is still up to the states to decide if they want federal monies based on which criteria they are willing to accept.

Figure IV–7. Percentage of Overall Education Decision-Making from Each Level of Government, 2007/2011



NOTE: The decision-making data for eleven countries (Belgium, Canada, Chile, Finland, Ireland, Israel, Poland, Slovak Republic, Switzerland, Turkey, and the United States) are from 2011 and the other countries rely on 2007 data. Brazil data are unavailable.
SOURCE: OECD 2012d (Education at a glance, Table D6.5). Trends in the percentage of decisions taken at each level of government in public lower secondary education (2003, 2007, 2011)

To begin to see if Finland's successful model of local school decision-making holds across the countries in this dataset, the original equations of human capital development (Equations 4.3a and 4.3b) are augmented with the percent of decisions made at the local level.

$$\text{Human Capital}_{cts} = \beta_0 + \text{EPIA}_{ct-3}\beta_1 + \text{GDPpc}_{ct-3}\,\beta_2 + \text{gEnrollment}_{ct}\beta_3 + \text{LocalDM}_c\beta_4 + \varepsilon \qquad \textit{eq. 4.5a}$$

$$\text{Human Capital}_{cts} = \beta_0 + \text{EPIM}_{ct-3}\beta_1 + \text{GDPpc}_{ct-3}\,\beta_2 + \text{gEnrollment}_{ct}\beta_3 + \text{LocalDM}_c\beta_4 + \varepsilon \qquad \textit{eq. 4.5b}$$

The variable for the percent of education decision-making that happens in each country (c) at the local level is "LocalDM".[43] The other variables are the same as in the earlier analysis and the results from the regression are listed in Table IV-6. For students' PISA reading scores, the percent of local decision-making has a significant impact whether there is means-tested demand-side spending or not in reading and science (only significant for EPI-A) but not math. Further analysis into each of the four categories of spending (resource and personnel management, the organization of instruction, or planning and structures) at the local level does not yield any results at any level of decision-making (models not shown). The only variable that has any significance in these models is the gross secondary enrollment rate control variable that accounts for the general level of student participation in the education system.

[43] For most countries in the dataset, the decision-making estimates come from 2007. However, as indicated at the bottom of Figure 4.6, some countries did not respond to the survey questions until 2011. Although the level of decision-making might have shifted between 2007 and 2011, any shifts would be expected to be small or incremental.

Table IV–6. Local Decision Making and Student Performance on the PISA Exam

	Equation 4.5a* **	**Equation 4.5a* **	**Equation 4.5a** **	**Equation 4.5b** **	**Equation 4.5b** **	**Equation 4.5b** **
Dependent Variable	Reading Scores	Math Scores	Science Scores	Reading Scores	Math Scores	Science Scores
EPI-A, 2006	39.8 (30.9)	32.9 (43.4)	19.9 (40.1)			
GDP per capita, 2006	0.0002 (.0003)	0.0004 (.0004)	0.0001 (.0004)	0.0001 (.0003)	0.0004 (.0004)	.0000 (.0004)
Gross enrollment 2009	1.22*** (.41)	1.10* (.57)	1.32** (.53)	1.05** (.39)	0.97* (.54)	1.22** (.5)
Percent decision making – local	34.4** (16.4)	22 (23)	38.6* (21.2)	32.4* (16.9)	20.2 (23.4)	38.3* (21.6)
EPI-M, 2006				29 (43.5)	25.7 (60.2)	2.14 (55.5)
Constant	328***(53.2)	341***(74.6)	341*** (69.1)	349*** (57.7)	357*** (79.9)	364*** (73.7)
Observations	32	32	32	32	32	32
R-squared	0.39	0.27	0.31	0.36	0.26	0.3

NOTES: Standard errors in parentheses, Brazil data do not exist
*** p<0.01, ** p<0.05, * p<0.1

One explanation for these null findings is that there may be an interaction between resource and personnel management decisions at the local level but regression analyses exploring this possibility did not reveal that the variables of interest had any significance. The underlying decisions themselves that are not part of this analysis may better explain the impact of local decision making. Theory and previous research would suggest that there is more motivation for local decision makers when they have more autonomy coupled with more public accountability via posted student test scores or a final exit exam for students (Woessmann, et al. 2009). Future research should further explore these decisions and their impacts.

Given the significance of local education decision-making, is there a negative impact when governments centralize their education systems? Equations 4.6a and 4.6b explore the same human capital development equations but instead of adding the percent of local decision making, the percent of central education policy decision-making is used.

$$\text{Human Capital}_{cts} = \beta_0 + \text{EPIA}_{ct-3}\beta_1 + \text{GDPpc}_{ct-3}\beta_2 + \text{gEnrollment}_{ct}\beta_3 + \text{CentralDM}_{ct}\beta_4 + \varepsilon \qquad \textit{eq. 4.6a}$$

$$\text{Human Capital}_{cts} = \beta_0 + \text{EPIM}_{ct-3}\beta_1 + \text{GDPpc}_{ct-3}\beta_2 + \text{gEnrollment}_{ct}\beta_3 + \text{CentralDM}_{ct}\beta_4 + \varepsilon \qquad \textit{eq. 4.6b}$$

The results are listed in Table IV-7 and show a significant and negative correlation across all subject areas between central decision-making and student performance for both the EPI-A and EPI-M measures of spending.

Table IV–7. Centralization and Student Performance on the PISA Exam

	Equation 4.6a* **	**Equation 4.6a** **	**Equation 4.6a*** **	**Equation 4.6b** **	**Equation 4.6b** **	**Equation 4.6b** **
Dependent Variable	Reading Scores	Math Scores	Science Scores	Reading Scores	Math Scores	Science Scores
EPI-A, 2006	37.6	30.9	17.1			
	(30.4)	(40.3)	(38.0)			
GDP per capita, 2006	0.00027	0.00045	0.00016	0.00019	0.00039	0.00013
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Gross enrollment 2009	0.91**	0.85	0.96*	0.76*	0.70	0.84*
	(0.39)	(0.52)	(0.49)	(0.38)	(0.49)	(0.46)
Percent decision making – central	-46.8**	-61.5**	-65.4**	-44.9**	-61.2**	-67.0**
	(20.1)	(26.7)	(25.1)	(21.1)	(27.6)	(25.8)
EPI-M, 2006				20.6	5.59	-14.0
				(43.5)	(56.9)	(53.2)
Constant	374***	385***	398***	399***	417***	435***
	(51.8)	(68.6)	(64.7)	(59.8)	(78.3)	(73.2)
Observations	32	32	32	32	32	32
R-squared	0.41	0.37	0.38	0.38	0.36	0.38

NOTES: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Essentially as more decisions are centralized, students are benefitting less from their school experience and they are not learning as much as they would from schools that are operating with local oversight.[44]

[44] The regressions were run with each level of government and only the local and central levels had any impact on student scores. State and regional, as well as school levels, produced insignificant results.

Section 4.4. Conclusion

The EPI measures provide some insight into how spending is impacting student enrollment rates and assessment scores which are in turn indicative of students' level of social and human capital development. Demand-side expenditures in the aggregate (means tested and non-means-tested expenditures that target families and students) do have a positive impact on enrollment rates. Further analysis of the demand-side spending shows that cash benefits and benefits in kind to families and students, rather than financial aid, are having the largest effects on gross secondary school enrollment. When countries target their demand-side spending to the most disadvantaged families and students and when they invest proportionally more in their schools, their students get better results on PISA exams. Though it is not possible to conclude that this supply-side spending provides students with top quality schools and the resources they need to succeed, it is implied.

As current research on what makes schools successful suggests, local decision making on the management of schools has a positive effect on student performance on the PISA exams. PISA research has revealed two things about autonomy: 1) Students who attend schools that can decide what is taught and how students are assessed do better on PISA exams and 2) in countries where accountability measures are not publicly available, schools that have more autonomy have students who do worse on PISA exams (OECD 2010e). The next step for assessing the success of local management of schools then, would be to explore different models of student assessment and how this impacts student outcomes but this is beyond the scope of this dissertation.

If a country is truly committed to improving its human capital it needs to spend money to help its less advantaged students get to, and stay in, school. Simultaneously, education spending needs to maintain and improve the quality of its public schools so that all students, once they get through the front doors, have the resources they need to learn. Where the money actually comes from does not appear to make a difference for human capital development – what matters is how the money is allocated.

To further complicate research into school systems, it is clear that there are multiple pathways to student success. As the variation in EPI-A and EPI-M scores reveal, countries with very different spending priorities are each able to successfully educate students who can achieve high marks on the PISA exam. The three highest scoring countries in reading, South Korea, Finland, and Japan, have EPI-M scores of .97, .95, and .89 respectively, and these same countries score at the top for science as well as math. These differing EPI-M scores, while not as variable as these same countries' EPI-A scores, show that successful countries are not doing things exactly the same way. Capital expenditures, the most significant supply-side spending category in the analysis when only means-tested demand-side spending is considered, is similar between the countries. Both Japan and Finland spend about 9% of their resources on capital expenditures while South Korea spends around 10% when EPI-M supply and demand-side spending is considered together. How these funds are being allocated would show how similar (or different) these expenditures are and why this spending in particular matters for students' level of achieved human capital. In the next chapter, human capital development will be explored at the student level in three rural Mexican schools. Means-

tested demand-side benefits are received by most of the students in the case studies and the impact of that spending is explored in more detail.

CHAPTER V

THE IMPACT OF DEMAND-SIDE EDUCATION SPENDING IN RURAL MEXICO: THREE CASE STUDIES

This dissertation introduced the Education Policy Index (EPI) in Chapter II and discussed why countries have the EPI scores they do in Chapter III. In Chapter IV, how the EPI impacts student success academically was evaluated. Thus far, students' gross secondary enrollment rates and their scores on the Program for International Student Assessment (PISA) exam have served as a proxy for human capital or students' marketable knowledge and skills. This chapter goes beyond these measures and discusses human capital indirectly by asking graduating students at two middle schools and one high school in rural Mexico about their social capital: their grades, school experience, and expectations of their future. Surveys administered at these three schools in the summer of 2012 asked graduating middle school and high school students to discuss their attitude towards school as well as their educational and professional goals – indicators that if achieved could forecast a country's economic growth. Most of these students are extremely poor and 55% to 80% of them benefit from an established means-tested demand-side spending program called *Oportunidades*.

Since supply-side spending at the school level is constant (students in the same classroom experience the same teachers and infrastructure), the differences between students within schools stems from their academic abilities, inspirations, and socio-

economic backgrounds. Across schools, however, it is possible to evaluate some of the supply-side differences and how these may impact students' attitudes towards school, academic achievement, and their potential careers. Principal interviews and surveys, school test scores, along with some school-level budget data, provide insight into the quality of the education schools provide. This analysis shows that middle school and high school students, and girls especially, who benefit from the demand-side policy evaluated in this research, *Oportunidades,* are at least as likely as their wealthier classmates to have high academic aspirations. It is more difficult to determine the difference between students when it comes to evaluating their professional expectations, however. *Oportunidades* appears to bring students of all financial circumstances together and creates a more even starting point so that nearly all students, regardless of their circumstances, can imagine a career that will provide a comfortable standard of living. Nearly all students, regardless of their background, recognize the importance of school for their future.

Section 5.1 introduces *Oportunidades*, Mexico's demand-side policy, **Section 5.2** explains the school system in Mexico and **Section 5.3** discusses how *Oportunidades* impacts Mexico's school system. **Section 5.4** presents the analysis of how students who benefit from *Oportunidades* are impacted by their school attendance, **Section 5.5** discusses the challenges schools face based on principal interviews, **Section 5.6** presents student opinions, and **Section 5.7** presents analyses of the student survey data.

Section 5.1. *OPORTUNIDADES*: Mexico's Leading Demand-Side Policy

Started in the late 1990's and known as the Program for Education, Health, and Food or PROGRESA (*Programa de Educación, Salud y Alimentación*) until 2001, Opportunities or *Oportunidades* is Mexico's largest anti-poverty program. Funded in part by the Mexican Government, in part by the World Bank, and in part by the Inter-American Development Bank (IADB), *Oportunidades* benefitted approximately 28 million people in 2011 at a cost of US$4.8 billion (Braine 2006; INEGI 2010; ECLAC 2011).[45] It is a conditional cash transfer program (CCT) that pays qualifying poor households on average US$35-40 a month if they meet a set of educational, health, and nutritional requirements including regular school attendance and medical appointments (Parker 2003; Fernald, et al. 2008; *Oportunidades* 2008; Behrman, et al. 2012). The program is currently run by Mexico's Ministry of Social Development or SEDESOL (*Secretaría de Desarrollo Social*) and is implemented by the National Department for the *Oportunidades* Human Development Program; since January 2012 funding for *Oportunidades* comes through the Ministry of Public Education (SEP) budget (World Bank 2010).

When the CCT program was first implemented as *PROGRESA* in rural areas in 1997, there was some evidence that beneficiaries were receiving the cash transfers as an act of patronage, though most poor rural families were in fact benefitting (Yuriko 2007; Yanes 2011). To reach the poorest populations, the federal government first targeted impoverished municipalities based on 1995 census data, then identified the poorest

[45] This is about 25% of Mexico's 112,336,538 people and represents 5.8 million families.

homes, and then went to those homes to verify the conditions and who lived in the households (Behrman and Skoufias 2006; Gertler, et al. 2012). Because the households continue to be geographically targeted via a proxy means test (i.e., indicators that correlate with poverty levels are used to determine family eligibility), the cash transfers in theory cannot be withheld or distributed with discretion (Diaz-Cayeros, et al. 2012; Cecchini and Madariaga 2011).

Moreover, even before Vicente Fox became president of Mexico in 2000 and changed the program's name to *Oportunidades*, certain mechanisms were put in to place to limit patronage through the program. For example, there are public information campaigns to directly communicate with beneficiaries, household eligibility reviews do not take place around election time, and the central government keeps local involvement over beneficiary decisions minimal – one exception being that it is the schools and medical professionals who confirm that families are meeting policy requirements (Parker 2003; Levy 2006; Jara 2008; Diaz-Cayeros, et al. 2012). Even the skeptics, though, agree that most of the eligible poor are being identified and benefitting from the program (Jara 2008; Cecchini and Madariaga 2011; Gómez Hermosillo 2011).

As of 2010, according to the World Bank, 51.3% of the Mexican population lives at the national poverty line and, in rural areas, this is as high as 60.8% (World Bank 2012a).[46] *Oportunidades* claims that these high levels are due to the 2008 global economic recession, and that these poverty estimates would be even worse without its

[46] The World Bank defines the poverty rate as the "percentage of the population living below the national poverty line. National estimates are based on population-weighted subgroup estimates from household surveys" http://data.worldbank.org/indicator/SI.POV.NAHC/countries/MX?display=graph.

conditional cash transfers (SEDESOL 2010). Independent analyses show that *Oportunidades* helps to reduce the depth of poverty of participants and also show that the long-term living standards of poor rural families increases when they invest their cash in productive assets such as chickens or other animals (Behrman and Skoufias 2006; Gertler, et al. 2012). In terms of overall inequality, the program does appear to have an impact on Mexico's Gini coefficient and one estimate claims that the program has contributed to a reduction of 2.7 points (Cecchini and Madariaga 2011, 119).

Eligibility to receive *Oportunidades* cash payments for students starts in the third grade and goes through high school, and the amount increases every year for both boys and girls (See Appendix F for the 2010 payout to families).[47] By some measures, participating families' income can increase by 10% per capita and for the poorest, cash transfers may increase per capita income by as much as 50% (Fiszbein and Schady 2009, 109-10; Cecchini and Madariaga 2011, 117-18). To incentivize girls to continue with their education, they are paid up to 13% more than boys starting in middle school when they usually drop out (SEDESOL 2010). In addition to these scholarships, students receive money for school supplies every 6 months. Further, students who complete high school before turning 22 will receive a Youth With Opportunities (*Jóvenes con Oportunidades)* bonus of nearly US$300 if they open their own savings account at a bank (SEDESOL 2010; Gómez Hermosillo 2011).

[47] In third grade students are usually between 8 and 9-years-old, about the age they would often be taken out of school to work. The program has changed since its inception and now includes funding for children under the age of 9 as well as the elderly. To qualify, families must meet means-tested poverty requirements.

Studies show that students whose families benefit from *Oportunidades* are more likely than other poor students to stay in school between elementary and middle school (Schultz 2004). "Research reveals that PROGRESA has had the largest impact on children who enter secondary school and represents a percentage increase of enrollment of more than 20% for girls and 10% for boys" (Skoufias 2005, xii). Since 2001 high school students have been included in *Oportunidades* and longitudinal analyses reveal that high school enrollment numbers have increased (Behrman, et al. 2011, 116). In Chapter IV the receipt of demand-side benefits was shown to have a positive impact on enrollment levels and the evidence here confirms this assertion.

Given how large the program has grown, *Oportunidades* now serves most of the poorest students in Mexican communities. Based on the research on *Oportunidades'* impact on enrollment rates and the findings in Chapter IV, students who benefit from the means-tested program should be at least as likely as their peers who do not need to receive the benefit to go onto high school.[48]

> *Hypothesis 5.1:* Middle school students who benefit from *Oportunidades* are at least as likely as their peers who do not benefit from *Oportunidades* to go on to high school

Since females get more financial aid from *Oportunidades* then their male counterparts for going to high school, and by some accounts are enrolling as much as or

[48] All hypotheses consider students who receive benefits to be at least as or even more ambitious than their classmates academically and professionally. The cash incentive should be helping them reach a baseline of interest in their future and they may be more ambitious than their peers since they have more to overcome to attain the standard of living they see their peers enjoy.

more than males, they would be expected to want to go to high school at least as much as male beneficiaries (Parker 2003). Additionally, since students who benefit from *Oportunidades* are incentivized to stay in school, their academic aspirations would be expected to exceed their parents' level of education that usually did not continue past primary school.

> *Hypothesis 5.2:* Female middle school students who benefit from *Oportunidades* are at least as likely as their male counterparts to go on to high school
>
> *Hypothesis 5.3:* Middle school students who benefit from *Oportunidades* are at least as likely as their peers who do not benefit from *Oportunidades* to want to attain a higher level of education than their parents

Behrman, Parker and Todd (2011) also show that students benefitting from *Oportunidades* seek work and males in particular find nonagricultural jobs, implying a shift away from the rural environment in which they are raised. Female students, whose mothers receive the cash benefits of *Oportunidades*, see their mothers become empowered as they take control over a part of the family finances and become more informed about the health care of the family (Behrman and Skoufias 2006). Accordingly, high school students' career expectations should be higher than their parents' current career choices. In addition, like middle school students, high school students who are benefitting from education incentives would be expected to want to attain a higher level of education than their parents so long as education opportunities are available.

Hypothesis 5.4: High school students who benefit from *Oportunidades* are at least as likely as their peers who do not benefit from *Oportunidades* to want to attain a higher level of education than their parents

Hypothesis 5.5: Male high school students who benefit from *Oportunidades* will be at least as likely as their peers who do not benefit from *Oportunidades* to seek nonagricultural jobs

With respect to how well *Oportunidades* students do in school once they are there, beneficiaries can keep their funding so long as they do not fail a grade more than once. On the other end of the success scale, though, while students are staying in school longer, there is no indication that they are doing better on tests of skills and knowledge (Behrman, et al. 2005). This raises questions around the quality of the schools students are being incentivized to attend – are they able to handle the increased enrollment numbers and what are they offerings students once they get through the front door?

Section 5.2. Mexico's School System: Supply-Side Policies In Action

The Mexican school system is mandatory for students until they have completed at least a lower secondary level of education (the equivalent of kindergarten through the ninth grade in the United States). If students want more schooling, they can go on to upper secondary schools or high schools, and then tertiary schools or institutions of higher learning (see Appendix 5B for an outline of Mexico's public school system). Approximately 90% of Mexico's students attend public schools that are largely run by

the federal Ministry of Public Education (SEP) in spite of attempts in the 1990's to decentralize the system.

The National Agreement for the Modernization of Basic Education or ANMEB (*Acuerdo Nacional para la Modernización de la Educación Básica*) was signed in 1992 by Mexico's federal and state governments, and The National Union of Education Workers or the SNTE (*Sindicato Nacional de Trabajadores de la Educación*). ANMEB formed the basis for the 1993 General Education Law or LGE (*Ley General de Educación*) that has undergone revision every couple of years but remains the driver of Mexico's education system (Santiago, et al. 2012, 18).[49] Essentially the law transferred much of the administrative and operational decisions to Mexico's states while keeping much of the funding control in the hands of the federal SEP and maintaining the SNTE's control over labor negotiations; centralizing power and decentralizing administration (Ornelas 1998 as cited in Santiago et al. 2008, 18). In effect, the federal SEP determines the curriculum, textbooks, most student assessments, and, with the SNTE, the hiring, firing, and salary schedules of most school personnel (Santibañez, et al. 2005; OECD 2009b; Santiago, et al. 2012).

The SNTE dates back to 1943 and until the 1990's acted as a political wing of the ruling political party, the Institutional Revolutionary Party or PRI (*Partido Revolucionario Institucional*). Allegiance to the party served union members well – they could advance in the education ministry (the SEP) that continues to control most

[49] Reforms were made to the law in 2002, 2004, 2006, and 2009. The 2007-2012 National Development Plan and Education Sector Program have set policy objectives and assessment goals that have driven much of the system's recent initiatives. Objectives include decreasing inequalities and promoting equality among students, and providing quality education to students so they can "participate productively and competitively in the workforce" (Santiago, et al. 2012, 41-42).

education policies (Murillo 1999). Once the PRI lost power, the SNTE did not lose its leverage thanks to the LGE that established the union as the body responsible for personnel appointments and continued the SNTE's partnership with the government at both the federal and now state level (Ornelas 2004; Fierro, et al. 2009, 5-6). The SEP-SNTE partnership is quite strong and they have a joint commission dedicated to overseeing how teacher's careers are regulated. Since the demise of the PRI's hegemony, the teacher's union has recognized that it has to negotiate with the changing federal government' leadership. Accordingly it has begun to modify some of its more corrupt practices and has conceded to more oversight on the profession with teacher assessments and evaluations becoming more frequent.

All public school teachers of basic education (kindergarten through ninth grade) are required to be members of the SNTE, now Mexico's largest union with an estimated 1.5 million members. Thanks to its large membership the SNTE is also quite wealthy – it is able to garner 1% of member's wages and, by some estimates, operates with a US$200 million annual budget (Elizondo Mayer-Serra 2009). According to Alvarez, Moreno, and Patrinos (2007), 50% of Mexican states have all of their teachers hired by the SNTE, about 7% of states have control of more than 50% of teacher hiring and about 45% of states have half of their teachers hired directly by the union while the other half of their teachers are determined by a competitive exam (10).[50]

[50] Due to rounding errors these numbers do not add to 100%. The competitive exams are only used for newly created teaching posts so these are not the majority of employment allocation – the SNTE is heavily involved in all teacher transfers and replacement/promotion post assignments (Santiago, et al. 2012).

With such power, the SNTE has been able to resist further decentralizing the education system even though research, as discussed in Chapter IV of this dissertation, shows such efforts could help improve student test scores (Santibañez, et al. 2005; Fuchs and Woessmann 2007; Woessmann 2007). Consequently, although teachers in Mexico benefitted most from past increases in education spending, there has been no simultaneous increase in meaningful accountability for student success or school quality (Bloom, et al. 2007). Starting in 2008, Mexico began to seriously address this issue with the Alliance for Quality in Education (*Alianza por la Calidad de la Educación*). This initiative was established to, among other things, modernize schools, prepare students for life and work, and to professionalize teachers and educational leaders (OECD 2010g, 42-43). To this end, a national teacher's exam has been implemented for all new teachers who must first be trained in an institute of higher education. Moreover, starting in 2012, the Universal Evaluation System (*Evaluación Universal de Docentes*) has been rolled out that ties teacher evaluation to student scores on the National Evaluation of Academic Achievement in Schools or ENLACE (*Evaluación Nacional de Logro Académico en Centros Escolares*) that were first implemented in 2005. The ENLACE tests are administered to students every year in primary and lower secondary school, as well as the last year of high school, and looks at students' and schools' progress in Spanish, math, and science. All results are made public and serve as a tool for families, schools, and the Ministry of Education to determine where help is needed most (OECD 2010g).

In Mexico there are four types of middle or lower secondary schools: regular schools, community schools that serve 10% of the secondary population, technical

schools (*secundaria técnica*) that serve approximately 25% of the secondary population, and television or video-based schools (*telesecundaria*) that serve around 20% of the secondary population (OECD 2009b). Community schools are designed for "marginalized, dispersed, and small areas … or those with important indigenous populations" (OECD 2010g, 47). The technical schools are vocational in nature and prepare middle school students for jobs in the local economy. In rural areas, for example, this would include milk or cheese production, farming, or clerical support.

Telesecundaria schools have one teacher for all subjects and classes are taught via satellite videos that are developed and scheduled by the Ministry of Education. These videos show master teachers teaching and, after reviewing the videos, students complete relevant exercises under the guidance of their local tutor for the rest of the class session. These distance-learning curricula are less expensive than regular schools that have a more developed infrastructure and teaching staff, and have enabled rural students to access lower secondary schools that would otherwise be unavailable. However, scores on ENLACE exams are usually lower for *telesecundaria* students than for technical school students and Behrman, et al (2009) have shown that students who go to *telesecundaria* schools are half as likely as their counterparts at technical schools to stay in school (254-55). This leads to the sixth hypothesis:

> *Hypothesis 5.6:* Students who go to technical middle schools are more likely to plan to go on to high school than students who go to *telesecundaria* middle schools

As shown in detail in Appendix G, high schools in Mexico are divided into four types: general baccalaureate (*bacchillerato general*), technical baccalaureate (*bachillerato tecnológico*), technology professional (*profesional técnico*), and job training (*capacitacíon para el trabajo*). The general baccalaureate schools, some of which are run by the federal government and some by the states, are geared towards college preparation. There are four types of technical baccalaureate schools that each focus on different professional fields, and these fields vary based on the industries in the region where the schools are located. The four focus areas are: 1) agriculture, 2) ocean science and technology, 3) industrial technology, and 4) general science and technology.

Agriculture students are prepared to work in a variety of areas including forestry, agribusiness, and landscape architecture. Students in schools of ocean science and technology study topics such as commercial fishing, marine engineering, and ship reconstruction or repair while industrial technology students study things like construction, manufacturing production, and mining. Each state's Ministry of Education also runs a system of general science and technology schools called *Colegio de Estudios Científicos y Tecnológicos* or CECyTEs (Lopez-Acevedo 2003; SEP 2012a). These schools train students in such areas as automotive repair, nursing, and computer programming depending on the skills needed in the state. Upon graduation, students are qualified to work at mid-level careers as "professional technicians, technical professionals or base level technicians depending on the type of institution they attend and the program they undertake" (Lopez-Acevedo 2003, 2). The professional technology schools, called *Colegio Nacional de Educación Profesional Tecnica* or CONALEP are

different because they offer extra courses and an exam that qualifies students to receive a special high school degree making advancement to higher education easier (Lopez-Acevedo 2003). Finally, the job training schools are geared towards adult education and, based on requests from community members such as single mothers, the homeless, or people with disabilities, will create an appropriate curricula to help students get available jobs (SEP 2012a).

Section 5.3. Supply Meets Demand

As discussed in Chapter II, Mexico's Education Policy Index score that includes all types of demand-side spending, its EPI-A score, is .73; its EPI-M score that only accounts for means-tested demand-side spending, is .83. These scores reflect a clear bias towards supply- over demand-side spending. As shown in Table 2.3a in Chapter II, teacher compensation accounts for 65% of the EPI-A spending and 75% of the EPI-M spending. Large classes and higher teachers salaries, but low cumulative spending per student by the government on education is not a combination geared towards successful schools (OECD 2010e, 84-85).[51] As *Oportunidades* drives enrollments higher, there has been some concern that schools will not be able to keep up with the growing demand on its resources. Yet, research based on interviews with school principals and teachers has shown there was not a significant decline in education services after the program was implemented; students were receiving the same level of services in infrastructure and other resources before and after the program began (Behrman and Skoufias 2006, 259).

[51] The OECD baseline for low cumulative spending by education institutions per student (ages 6 to 15) is US$39,463 and high cumulative spending is US$81,236 (OECD 2010e, 85).

The level of these services, however, is underwhelming. In one 2007 report by the National Institute for Educational Evaluation or INEE (*Instituto National para la Evaluación de la Educación*), among other shortcomings, more than 25% of Mexico's public schools have maintenance problems and only 54% of *telesecundarias* had library chairs and tables (García, et al. 2007, 59, 63). When schools do want to get additional funds to improve the quality of what they offer students, school principals can apply to approximately 200 federal and state programs. Applications to these programs, however, require administrative foresight and logistical skills, as well as an ability to report back to the government on a regular basis; these are often requirements that rural school principals are especially ill-equipped to meet (Hopkins, et al. 2007).[52]

One consequence of schools maintaining their infrastructure and pedagogical status quo is that student performance on assessment exams have not improved and in some areas have declined since *Oportunidades* was implemented (Behrman, et al. 2000; Muñoz-Izquierdo 2007). Students who receive demand-side policies may become more interested in going to school if they see an opportunity for themselves, but they may not be the strongest students. That is, *Oportunidades* may be attracting students who would otherwise be more motivated to leave school when they do not perform well, and their attendance may be driving scores downward.

As discussed in Chapter IV and shown with Equations 4.5a and b, high gross secondary enrollment rates were positively associated with higher scores on the PISA exam when there is a high level of local (not school) decision making. Mexico actually

[52] This was confirmed in interviews with rural principals in Hidalgo, Mexico (Summer 2012).

reports that no school-related decisions are made at the local level. In Figure IV-6 in Chapter IV, the breakdown of Mexico's education decisions show that 50% of decisions happen at the state level, 30% at the federal level, and 20% are happening at the school level. Thus, if enrollment rates are high because of demand-side policies, education policy decision-making is happening at ineffectual levels of government, and assessment scores are dropping, what are the benefits of the education students, especially those living in rural areas, are being encouraged to receive? While it is not possible to assess individual students' level of marketable skills and knowledge for this dissertation, it is possible to access the results of the ENLACE exams at the school level, and to ask students what they think the advantages are for going to the schools that are available to them.

Section 5.4. The Cases and the Methodology

To assess whether or not education spending is contributing to the development of human capital in Mexico, and more specifically to address the hypotheses stated earlier in this chapter (see Appendix H for the complete list of hypotheses), the graduating students and principals at three rural schools in Mexico were surveyed during the summer of 2012.[53] The selected schools are located in the municipality of Calnali, Hidalgo where, according to the 2010 Mexican census, 60% of the 16,962 residents are under the age of 15. The municipality is 82 square miles of mostly mountainous terrain

[53] The English version of the student survey is reproduced in Appendix 5D and the English version of the principal survey is in Appendix 5E. The surveys were approved by the Texas A&M Internal Review Board (Number IRB2012-0281).

and most land is forest or allocated to agriculture or grazing. The reported gross revenue of the municipality is US$4.6 million and the main occupations are in farming and ranching.[54]

The average education level of Calnali's population, ages 15 or older, is 5.8 years or a sixth grade level but, according to the 2010 census, the literacy rate is 97%. Most of the population has electricity (93%) but just 50% say they have a refrigerator and only 17% have a washing machine (INEGI 2010). Table V-1 shows how the population of students surveyed in the town of Calnali for this dissertation compares, based on the 2010 Mexican census, with the general population of the municipality (also called Calnali) and the Mexican state where the municipality is located (Hidalgo).

Table V–1. Profile of Surveyed Student Population Compared with Census Data

	2012 Student Survey Population	2010 Mexican Census – Municipality of Calnali*	2010 Mexican Census – State of Hidalgo*
Hard floors (not dirt)	94%	80%	92%
Television	94%	77%	87%
Computer	17%	6%	20%
Washing Machine	25%	17%	48%
Refrigerator	73%	50%	71%
Population Size/Number of houses	228**	4,441	669,408

NOTE: These percentages reflect the number of houses that have these features. These numbers are comparable to the student survey population since each student is representing one house.
**232 students participated in the survey, 228 responded to these questions
SOURCE: The municipality of Calnali and the state of Hidalgo data are from the 2010 Mexican census (INEGI 2010)

[54] Corn, beans, and green chili are the main crops and the main farm staples include eggs and milk; grouse, sheep, turkey and cows are the dominant meats.

Serving the student population throughout the municipality are 25 preschools, 27 primary schools, two indigenous or community schools, 1 technical middle school, 12 *telesecundaria* middle schools, and two high schools (INEGI 2010). More than 60% of students and their families in the municipality benefit from *Oportunidades* and the program has been active here for over 10 years.[55]

In the capital city of the municipality, Calnali (population 4,100), there is one general science and technology high school serving 510 students, and one technical middle school educating 207 students. Students come from all around the municipality to go to these schools. Most students in the district stay in school until the age of 14 (93%) but only 37% of youth ages 15 to 24 go on to high school. Most of these school's graduating students participated in the survey shown in Appendix 5D. Of the 147 students graduating from the general technology and science high school (CECyTEH), 132 or 90% responded to the survey and 70% of these students reported receiving the *Oportunidades* benefit.[56] From the technical middle school, 63 of the 67 graduating students or 94% participated in the survey and of these students, 55% reported that they were receiving *Oportunidades* monies.[57]

[55] The state of Hidalgo was part of the initial PROGRESA implementation. Requests to the central *Oportunidades* office to confirm if the Calnali municipality was part of the original grouping went unanswered. Members of the community communicated to the author that the program has been active there since 2000.

[56] The "H" at the end of CECyTEH stands for Hidalgo and indicates that it is a CECyTE high school run by the state of Hidalgo (each CECyTE is state run).

[57] There were two surveys – one for high school and one for middle school students. The only difference between the surveys was question 7 and asked about the student's plans post-graduation. The middle school survey asked the student to indicate which high school or vocational school he or she planned to attend whereas the high school survey asked which vocational school or university the student planned to attend.

Papatlatla (population 2,750) is the second largest town in Calnali and has a *telesecundaria* middle school serving 157 students as well as a general baccalaureate high school or COBAEH (*Colegio de Bachilleres del Estado de Hidalgo*) that serves less than 100 students.[58] Of the 40 graduating *telesecundaria* students in Papatlatla, 37 or 93% were surveyed for this study. Approximately 80% of the students who participated at the *telesecundaria* receive *Oportunidades* benefits and this makes analysis of the policy's impact on student performance difficult; it is statistically difficult to compare 80% of a population with 20%. Table V-2 profiles the middle and high school populations that were surveyed.

[58] The high school students in Papatlatla were not surveyed; the school appeared to be going through renovations and was vacant each time the researcher was in the town during the summer of 2012.

Table V–2. Profile of Surveyed Schools

	Total Students	Male Students	Female Students	Total Graduating (third year) Students	Total Graduating Student Survey Participants	Number of Graduating Female Student Survey Participants	Number of Graduating Male Student Survey Participants	% Graduating Students Receiving *Oportunidades*	Full-Time Teachers	Part-Time Teachers	Teacher to Student Ratio
Technical Middle School	207	96	111	67	63 (94%)*	27	34**	55%	3	8	1:19
***Tele-secundaria* Middle School**	157	79	78	40	37 (93%)*	20	17	80%	6	_____	1:27
CECyTEH High School	510	248	262	147	132 (90%)*	63	49**	70%	8	8	1:32

* Percent of the graduating class that responded to the survey
** Not all students responded to this survey question so numbers do not add to total student survey participants
SOURCE: Interviews with School Principals and Survey responses

The *telesecundaria* does not have any part-time teachers and even though the lessons are taught virtually, there are six on-site "teachers" who help students work through their lessons. While there is much debate in the education literature around what is the best teacher-to-student ratio, the classroom sizes reported here were not considered unwieldy or difficult to manage.[59] Table V-3 lists the surveyed middle school students' 2012 average ENLACE scores.

Table V–3. Middle School 2012 ENLACE Scores of the Graduating Class*

	Total Graduating Students	Spanish	Math	Science
Technical Middle School	**67**	**482**	**557**	**514**
Technical Middle School: National Average	_____	484	499	494
Technical Middle School: State Average	_____	479	541	509
***Telesecundaria* Middle School**	**40**	**479**	**521**	**508**
Telesecundaria: National Average	_____	484	569	516
Telesecundaria: State Average	_____	475	581	522

* Graduating students at all schools are in their respective third years
SOURCE: ENLACE

Since the ENLACE exams are annually administered it is possible to get the scores for the class that was surveyed in 2012 and for each of the preceding 2 years. Though it is not clear how much of the original cohort remains in the graduating class, the average scores have not improved over time (SEP 2012b).

[59] This assertion is based on observation, student interviews, and teacher comments.

As would be predicted based on previous studies, the *telesecundaria* students' 2012 ENLACE scores are not as high as their technical school peers in Calnali (Behrman, et al. 2009). The technical middle school in Calnali assigns students to one of three vocational focus areas: Agriculture, Farm Products, and Secretary. Students in Agriculture learn how to plant and harvest while those in the Farm Products group learn how to manage the production of milk, cheese, and other farm goods. Those students in the Secretary section focus on administrative skills and all students take a core set of classes that cover Spanish, math, and science from the same set of teachers.

The focus areas group the students but they do not receive significantly different resources from the school (this is not like the Advanced Placement or remedial programs in the United States). Their specialization exposes them to one unique class that is germane to their field but the rest of their classes are the same. The ENLACE test scores show that in 2012 the graduating class in Calnali scored above the national and state averages for technical middle schools throughout Mexico in all three subjects except Spanish where students score below the state average. Based on these assessments, the school is performing competitively within Mexico.

Table V–4. Graduating Middle and High School Student Academic Grades and Year Repetition

	Grades*					% of students who repeated a year or more in:		
	6	**7**	**8**	**9**	**10**	**Elementary School**	**Middle School**	**High School**
Technical Middle School – Overall	0%	19%	32%	**38%**	10%	13%	5%	____
Technical Middle School – Agriculture Students	0%	14%	**41%**	**41%**	4%	22%	9%	____
Technical Middle School – Farm Product Students	0%	18%	**32%**	**32%**	18%	4%	0%	____
Technical Middle School – Secretary Students	0%	27%	20%	**47%**	6%	13%	7%	____
Telesecundaria	5%	38%	**41%**	16%	0%	19%	6%	____
High School – Overall	0%	7%	**51%**	41%	1%	16%	2%	2%
High School – Automotive mechanics	0%	16%	**58%**	26%	0%	31%	3%	3%
High School - Nursing	0%	5%	**65%**	30%	0%	19%	0%	0%
High School – Computer Science	0%	3%	41%	**55%**	1%	9%	2%	3%

* Grades in Mexico correspond to the U.S. system as follows: 6 = F, 7 = D, 8 = C, 9=B, 10 = A

NOTE: Students who completed the survey reported their grades and year repetition. Four technical middle school students and six high school students did not report grades; all *telesecundaria* students reported. One *telesecundaria* student and three high school students did not report grade repetition in elementary and middle school; all technical middle school students reported. Three high school students did not report grade repetition in high school. Averages are based on the number reporting. Percentages in bold indicate the grade received by the majority of students.

Most technical middle school students (94%) responded to survey question three asking them to report their average grade for the previous year. As shown in Table V-4, most students had an average grade of "8" or "C" though there is variation between focus areas; the Secretary students reported a higher average of a "7" or B grade. All technical middle school students responded to question 4 of the survey asking them how many times they had to repeat a year of elementary or middle school, and 5% of students reported repeating a year of middle school whereas 13% repeated a year of elementary school. These rates of year repetition are lower than the national average that is estimated to be 33% for elementary and lower middle school (Puryear, et al. 2012, 88).

In the *telesecundaria* students are not broken into groups – all students receive the same video classes as mandated and scheduled by the SEP. On the ENLACE exams, Papatlatla's middle school students score worse than their *telesecundaria* peers with the exception of Spanish; here they score above the state average but below the national average. Noteworthy is that in 2012 the *telesecundaria* students in Papatlatla scored above the average technical middle school students in the state of Hidalgo in math and science. When it comes to grades, all the third year/graduating *telesecundaria* students responded to the question and reported averaging mostly C's (41%) and D's (38%) across all subjects. All but one student answered the survey question about grade repetition and 19% said they repeated at least one year of elementary school but only 6% reported repeating a year of middle school – again, this is well below the estimated national average.

The graduating/third year high students at the general technology and science high school in Calnali (CECyTEH) are also required to take the ENLACE exams. Their raw scores are not available but what is published is the percent of CECyTEH students who score poorly or well on the exam and these percentages are reported at the school, state, and national levels. Based on that data, in communication (Spanish) and math, the students at the Calnali high school have higher ENLACE scores on average than their counterparts in other CECyTEH high schools in Hidalgo and nationwide. For this type of high school then, students who are interested in these subjects would do well to go to the Calnali high school. In so far as the high school students' grades and year repetition, Table 5.4 profiles the graduating class overall as well as by sub-field. In general, with 98% of students responding, 16% repeated a grade in elementary school, 6% repeated in middle school, and only 2% reported repeating a year in high school. Most students (51%) said they had C averages last year but 55% of computer science students reported having a B average.

Section 5.5. School Budgets and Challenges

According to the sub-principal at the technical school and the principal of the *telesecundaria*, the biggest challenges to the schools in Calnali are the lack of science and audio-visual equipment, computers, and instructional materials, as well as the lack of an Internet connection. Moreover, neither school has adequate support staff. The technical school also felt that they had inadequate furniture but did not feel they were

missing any teaching expertise. Both schools have libraries but neither has a librarian, and claim to have between 1500 and 2000 books.

Both schools confirmed that teachers are hired and fired by the state and federal SEP with input from the SNTE, and that the state pays the teachers. Budgets for school maintenance and supplies are established at the state and federal level for both schools but the *telesecundaria* principal indicated that he had approximately US$2500 that he could allocate – about half coming from monies collected from students' families and the other half coming from a government program called Support to the School Management or *Apoyos a la Gestion Escolar* (AGE).[60] The money was spent on school supplies and furniture, needed maintenance, and even cultural events. At the technical school the principal indicated that he, rather than the state, could allocate how the money he was sent could be spent and his priorities were quite similar to those of the *telesecundaria* principal.

In terms of where the money comes from for salaries and major expenses, the *telesecundaria* indicated that it was federally funded whereas the technical middle school principal indicated that 90% was from the federal SEP and 10% was from the state. This is in contrast with the high school principal who indicated that 47% of funding is from the national government and 47% is from the state government with 4% coming from the municipality, 1% from families and 1% from other donations.

[60] AGE is designed to get parents involved in their student's school and education. For a school to receive around $1000 from the program, teachers, principals, and parents need to develop and submit a working plan to SEP that is designed to improve the school. The plan can request things such as school furniture, supplies, or even needed maintenance. http://www.conafe.gob.mx/contraloriasocial/Documents/cs-cartel-age-2011.pdf

For students who choose to go to the local science and technology high school, they have three areas of study they can pursue: nursing, auto mechanics, or computer science.[61] As in the middle technical school, students must complete a set of core classes in addition to those that are part of their selected focus area though in high school they are not required to choose a particular area of study. Students who go into nursing tend to be female and upon graduation have to do a year of service in which they practice basic nursing in a smaller town in the municipality. Students can then go on to a nursing college or another profession altogether if they so choose (if they do not want to go on to have a nursing career, they could skip the year of service). The students who choose auto mechanics are usually male and they learn how to repair cars along with principles of electricity and other basic sciences. The computer science students learn about networking and basic computer repair in addition to the core classes and are fairly evenly divided between male and female. The lack of Internet connectivity at the school, however, as well as a limited supply of working computers, has constrained the quality of the program.

The high school principal stressed that the biggest challenges they have from an instructional perspective is the lack of science equipment and working instructional materials. The principal also indicated that they are short on math, nursing, and electronics teachers, making these disciplines more difficult to teach.

[61] For those students that do not drop out of the education system, some will go to the local high school and some will decide to relocate to go to a better or different high school in a different town. These students either rent a room or live with relatives when they relocate. Several students surveyed for this study indicated that they were living away from home to go to the Calnali high school even though they were not asked directly. From the middle school data 31% of the technical school students and 16% of the *telesecundaria* students indicated that they planned to relocate.

Table V–5. Principal-Reported Supply Versus Demand-Side Spending

	Supply-Side Spending				Demand-Side Spending		
	Teacher Salaries	Non-Teacher Salaries	Infrastructure Funding	Curriculum	Financial Aid	Cash Benefits	Other
Technical Middle School	70%	20%	10%	0%	0%	0%	0%
High School	60%	25%	13%	2%	0%	0%	5%

NOTE: The schools' principals reported these percentages and the *telesecundaria* principal did not respond to this question. The high school principal's estimate exceeds 100%.

Finally, the principals at the technical middle school and the general technology and science high school were able to indicate how much of their total funding for a typical school year went to supply versus demand-side expenditures. Their answers are shown in Table V-5 and confirm that salaries exhaust most available funds explicitly allocated for education purposes. The principals reported that 90% of the middle school's funds go towards salaries and 85% of the high school's funds go toward teacher and non-teacher salaries. At the high school the principal indicated that there are 21 general technology and science high schools in Hidalgo and that three are renovated every year so that every seven years the school is eligible for upgrades determined by the state SEP. Further, at both schools the principals are not involved in curriculum spending decisions and the only demand-side spending from the high school reflects money used to help students with some supply or uniform costs.

Unfortunately it is not possible to create an EPI index for each school in this case study. While we have some idea of the percentages of funding allocated to each category

of supply-side spending, it is not known how much money is actually being spent. On the demand side of the EPI equation, the number of students receiving benefits is known but other benefits going to their families are unknown thus the needed data are unavailable. What we do know, however, is that some students are receiving a particular cash benefit that is means-tested and that this could be contributing to their social and subsequently human capital development in addition to the resources available at their school.

Section 5.6. Student Attitudes Towards Their Schools and Career Plans

To determine what students thought about the usefulness of their school, they were asked seven questions. Four questions (question 5a through 5d) asked them if they totally agreed, agreed, disagreed, or totally disagreed with the following four statements:

1) School has done little to prepare me for adult life when I leave school
2) School has been a waste of time
3) School has helped give me confidence to make decisions
4) School has taught me things which could be useful in a job

On average, students responded that school has taught them skills they would use in a job and that they gained confidence from their experience; only 3% felt that school was a waste of time or that it did not help them gain the skills they needed for a career. While the majority saw school as an advantage, as many as 30% of students felt school

did not prepare them for adult life and some 10% felt that school did not help them gain the confidence they needed to make good decisions.

Question 6 is an open-ended question and asks students to consider what specific skills or knowledge they had gained in school that could be useful in a job and the overwhelming majority of students felt that having an area of study, gaining a vocational skill, was the biggest advantage for coming to school. Second was general knowledge or subjects outside of their area of study, and third was learning self-confidence and being respectful or getting along with others. The fourth most popular response was that they learned a lot about technology and computers. Learning English was not important to most students but it was mentioned enough to be in the top five. Some specific skills that were noteworthy responses include time management, animal care, cooking, and landscape drawing.

Questions 10 and 11 asked students to consider what they liked most and least about their educational experience at school. Every student mentioned that they liked learning something new or socializing with their friends. Playing soccer was also mentioned frequently. The least liked aspects of school were studying math and getting too much homework. A close third were complaints about teachers. Either teachers were not showing up at all, they had meetings during class time, or they had a negative attitude towards the students. One respondent wrote that, “Sometimes not everyone complies with the rules of the school – neither the students nor the teachers.” Mean or bullying students, uniforms, even nail inspections made the list of the least liked aspects of the schools. Throughout the comments the issue of respect repeatedly surfaced. There

is a general attitude among students that learning to respect elders, others, and ones self is an integral part of what one learns in school, and this was much lauded by students at all three schools.

To evaluate students' expectations of their academic and professional future, survey respondents were asked about their plans in two ways. Question 7 asked students to consider what they planned to do after they graduated in terms of more schooling or professionally, and question 12 asked them to consider what they wanted to be when they grew up. These two questions allowed for responses to be validated and gave space for respondents to consider their answers more fully. Of the high school students who responded to the survey 77% articulated a career choice and they overwhelmingly were interested in the jobs they were currently preparing for (nursing, auto mechanics, or computer networking) even if they indicated that they wanted to continue their education. Approximately 30% wanted to pursue higher education to work in more selective jobs that required more advanced university degrees (e.g., medical doctors or lawyers).

Middle school students had a much harder time describing their future plans beyond high school. From the technical and *telesecundaria* middle schools, of those students that responded to questions 7 and 12 with a particular career in mind, the majority sought highly selective jobs that require high-level degrees.

To compare students' job aspirations against peers as well as their parents, all jobs mentioned by survey respondents have been organized into 5 categorizes. The lowest category is a "1" and includes jobs that do not require any literacy or education,

namely domestic and field labor work. Category "2" includes vendors, building assistants and farmers – jobs that require a low level of math and Spanish literacy. Those jobs in category "3" include jobs that require technical know-how and a fair amount of literacy (e.g., mechanics, plumbers, and carpenters). Category "4" is for jobs that require further schooling or certification such as police officers, teachers, nurses, or accountants. Lastly, category "5" is for those professions that require extensive schooling and cognitive skill: professors, lawyers, engineers, doctors, and architects. Appendix 5F summarizes each category and lists the professions that were explicitly mentioned by survey respondents.

The challenge of establishing an occupational hierarchy is multifaceted. The approach taken for this chapter is based on education and cognitive requirements for the jobs under consideration. Past literature has used composite socioeconomic indexes based on "three measures of occupational standing: educational level, wage rate, and prestige" (Hauser and Warren 1997, 225). In the Hauser and Warren (1997) analysis cited above, the authors make the case that a job's required educational level is more important to determine a job's occupational standing than the prestige and wage factors – both of which can be highly variable over time and location. In addition to education level requirements, however, the categories in this chapter also consider the necessary aptitudes and skills a job demands. To discuss the details of a job's skill requirements, researchers used to look to the now defunct *Dictionary of Occupational Titles* or DOT (Hartog 2000). This dictionary listed job requirements based on interviews with human resource personnel as well as people who held the job under review. The DOT has been

replaced by O*NET – an online database maintained by the U.S. Department of Labor – and provides occupation details such as skill and experience requirements, and the types of tasks workers have to perform on the job. Given that this analysis is geared towards careers in rural Mexico, however, this guide was not particularly useful for occupational categorization.

In 2008 the International Labor Office (ILO) of the United Nations asked experts on labor statistics to update the International Standard Classification of Occupations (ISCO). While this classification is extensive it does not reflect a job hierarchy based on skill or salary, nor does it offer occupational information such as job requirements. The ISCO does, though, provide a useful outline for job categories. The occupational categories used in this chapter are based on the ISCO and considers the current jobs held by the parents of students who participated in the survey as well as students' career aspirations. Given the current employment opportunities in Calnali, Hidalgo, as well as the educational offerings available to its population, the ordered occupational categories created for this chapter captures the regional character and indicates, as the numbers on the scale increase, upward mobility for workers.

The argument in this dissertation is that the demand-side spending that helps students get to a school is critical for enabling students who would otherwise drop out, but this type of spending is beyond the purview of individual schools. The only way to assess demand-side spending impacts on building social and human capital at the individual level, therefore, is to evaluate students who do benefit from the policies and to see how they compare to their classmates who do not receive the benefit.

Section 5.7. Survey Data Analysis

Hypothesis 5.1 claims that middle school student who benefit from *Oportunidades* are at least as likely as their peers who do not benefit from *Oporutnidades* to go on to high school. At the *telesecundaria* in Papatlatla, 80% of students receive *Oportunidades* and of those who do not receive the benefit (7 of the 37 students), more of them do not want to go on to high school (question 7 of the student survey). A cross-tabulation (see Table V-6), shows that there is a significant correlation (P= .004) between the *telesecundaria* students who receive *Oportunidades* and those who plan to go on to high school.

For this population, a group more disadvantaged than the technical middle school students, *hypothesis 5.1* holds and the students who benefit from *Oportunidades* are more likely than their peers who do not benefit from *Oportunidades* to go on to high school. At the technical middle school in Calnali, however, 89% of students plan to go on to high school and this does not have a significant correlation with whether or not the students receive *Oportunidades* benefits. As more middle school students in a population decide to pursue a high school diploma, the effect of *Oportunidades* may be less about influencing such decisions as it is about helping students to have the same options as their wealthier peers.

Table V–6. *Telesecundaria* and Technical Middle School Students and Their Plans for High School

	Telesecundaria* students				**Technical middle school students****			
	Does not receive *Oportunidades*	Receives *Oportunidades*	Total	Percent Receiving *Oportunidades*	Does not receive *Oportunidades*	Receives *Oportunidades*	Total	Percent Receiving *Oportunidades*
No high school plans	**4**	**3**	**7**	**43%**	**2**	**5**	**7**	**71%**
High School plans	**3**	**27**	**30**	**90%**	**25**	**30**	**55**	**55%**
Total	**7**	**30**	**37**	**81%**	**27**	**35**	**62**	**56%**

NOTE: All *Telesecundaria* students responded to this question whereas one technical middle school student did not.
*Pearson $X^2 = 8.22$, P= .004
** Pearson $X^2 = .72$, P= .40

At the high school level, 78% of all student respondents indicated that they wanted to pursue more schooling. The correlation between whether or not a student received *Oportunidades* and his or her desire for more education was barely significant (P=.10) but it does indicate that students who are able to stay in school thanks to *Oportunidades* are as likely as their peers to want to pursue higher education. Table V-7 shows this tabulated correlation.

Table V–7. Surveyed High School Students and Their Plans for Higher Education

	Does not receive *Oportunidades*	**Receive *Oportunidades***	**Total**	**Percent Receiving *Oportunidades***
No plans for higher level degree/university	**5**	**24**	**29**	**83%**
Plans to go on to higher level degree/university University	**34**	**69**	**103**	**67%**
Total	**39**	**93**	**132**	**70%**

NOTE: All high school students responded to this question.
Pearson $X^2 = 2.70$, P= .10

Hypothesis 5.2: Female middle school students who benefit from *Oportunidades* are at least as likely as their male counterparts to go on to high school

Looking at just the students who receive *Oportunidades* at all of the schools surveyed, 58% of the *telesecundaria* beneficiaries are girls, 67% are girls at the technical middle school, and at the high school, 59% of beneficiaries are girls. In the

telesecundaria all of the 20 girls in the graduating class (100% of the female students) receive cash transfers. Overall, at the middle schools and the high school surveyed, among *Oportunidades* beneficiaries there is no statistically significant relationship between the sex of students and their desire to continue their education. This could mean that there is a negligible gender gap for beneficiaries and that the opportunities for education at the middle and high school levels in this region are equalizing. In other words, female *Oportunidades* students may be just as likely as male *Oportunidades* students to stay in (or leave) school. However, with such a small sample this would need to be validated in future studies with larger populations.

At the high school level, however, there is a statistical difference between girls who receive cash transfers and those who do not (See Table V-8). Of the graduating girls in the high school, 70% receive *Oportunidades* benefits and there is a statistically significant relationship (P=.04) between receiving cash benefits and their desire for more education. One explanation for this is that at the high school the students who are registered in nursing are all female, and nearly all want to become nurses or another type of medical professional, and all of these occupations require more schooling.

Table V–8. Is There a Difference Between Graduating Female High School Students Who Get Cash Transfers and Those That Do Not?

	Graduating Female students who do not receive *Oportunidades*	Graduating Female students who receive *Oportunidades*	Total
No plans for higher level degree/university	**1**	**13**	**14**
Plans to go on to higher level degree/university University	**17**	**32**	**49**
Total	**18**	**45**	**63**

*Pearson $X^2 = 4.05$, P = .04

Looking more broadly at the middle school population, without considering which students are receiving demand-side policy benefits, there is a significant relationship between the sex of the student and whether or not they plan to go on to high school. The results of the analysis are shown in Table V-9 for both middle schools (*telesecundaria*, P=.02; the technical middle school, P=.08). What appears to be driving the relationship is that there are more boys deciding to go to work instead of pursuing high school.

Table V–9. Middle School Gender Differences in High School Aspirations

	Telesecundaria		Technical Middle School	
	Females	**Males**	**Females**	**Males**
No plans for High School	**1**	**6**	**1**	**6**
Plans for High School	**19**	**11**	**26**	**27**
	20	**17**	**27**	**33**
	Pearson $X^2 = 5.50$ P= .02		Pearson $X^2 = 3.02$ P= .08	

Hypothesis 5.3: Middle school students who benefit from *Oportunidades* are at least as likely as their peers who do not benefit from *Oportunidades* to want to attain a higher level of education than their parents

Most students in school in rural Mexico exceed their parents' level of education if they go to high school and usually they match their parents' education by completing middle school. (As mentioned earlier, the average level of education in this region is sixth grade). Of the students surveyed, no students at the *telesecundaria* reported having a mother with an education level above middle school. The education level of mothers is of particular importance since it often serves as an indicator for students' academic advantages that stem from the home learning environment a mother can provide. Research has shown that there is usually a strong positive correlation between "mothers' educational attainment and children's test scores, academic outcomes, and cognitive development" (Magnuson 2007, 1497). Table V-10 shows the *telesecundaria* students' expectations and their parents' education level regardless of their receipt of *Oportunidades.*

Table V–10. Influences of Parents' Education Level on all *Telesecundaria* Students' Academic Expectations (Regardless of Whether or Not They Receive *Oportunidades*)

	Mother's Education Level*					Total
	No School	Elementary School	Middle School	High School	College/University	
No high school plans	4	2	1	0	0	7
High School plans	12	14	4	0	0	30
Total	16	16	5	0	0	37
	Father's Education Level**					Total
	No School	Elementary School	Middle School	High School	College/University	
No high school plans	5	0	2	0	0	7
High School plans	10	13	4	1	1	29
Total	15	13	6	1	1	36

NOTE: One student did not respond to the father's education level question (37 *telesecundaria* students participated).
* Pearson $X^2 = .82$, P= .66
** Pearson $X^2 = 6.2$, P= .18

Since fathers are less reliably a part of the home life, their influence beyond fiscal contribution is not usually discussed in the literature. For the *telesecundaria* sample, 94% of the fathers have no more than a middle school education – one father had completed high school and one other father had completed some sort of college degree. Regardless of whether or not the student at the *telesecundaria* benefitted from

Oportunidades, the lack of variation in parents' education level yielded no results for this population. Essentially none of the parents are educated and so a student's plans to further his or her education is coming from other influences. It could be that students realize that education matters for economic gain and perhaps the cash benefit of *Oportunidades* is incentivizing them to continue their education. Based on some of the responses to the open-ended questions on the surveys, there is a general appreciation for education and the gains it can bring.

Seventy-five percent of the students in the technical middle school who responded to the survey have parents who did not go on to high school and some 40% have parents who did not go beyond elementary school. More mothers of students in the middle school did go on to high school and college than fathers, but there is no relationship between mothers' education level and students' desire for more school. However, for this population there is a slightly significant (P=.09) relationship between the fathers' education level and students' planning to get more education. This may indicate that, in this region at least, fathers are having an influence on their children (See Table V-11 for the detailed analysis). There are two students who, even though their fathers pursued an education beyond high school, decided to stop their education after middle school. In these cases they may not see the advantage of more schooling since their fathers were not able to capitalize on their investment in education. Since most mothers did not go beyond high school and most students want to pursue higher education, there is not enough variation to determine if there is a relationship between mothers' education levels and students' education plans.

Table V–11. Influence of Parents' Education Level on all Technical Middle School Students' Academic Expectations (Regardless of Whether or Not They Receive *Oportunidades)*

	Mother's Education Level*					Total
	No School	Elementary School	Middle School	High School	College/ University	
No high school plans	2	1	1	1	2	7
High School plans	7	15	20	7	5	54
Total	9	16	21	8	7	61
	Father's Education Level**					Total
	No School	Elementary School	Middle School	High School	College/ University	
No high school plans	2	2	0	0	3	7
High School plans	8	13	20	5	6	52
Total	10	15	20	5	9	59

NOTE: Not all students responded to these questions (63 technical middle school students participated).
* Pearson $X^2 = 4.00$, P= .35
** Pearson $X^2 = 8.00$, P= .09

Looking at just the *Oportunidades* beneficiaries in the technical middle school, however, there is a significant relationship between both mother and fathers' education attainment and students' expectations to go on to high school (See Table V-12). The pattern is stronger for mothers' education attainment as theory would suggest, and this implies that among the poorest students in these rural communities, a push for more education for girls especially has the potential to positively impact future generations. This does not mean that fathers do not model for their sons the importance of education.

Given the data there is clearly a paternal influence that bolsters the case for incentivizing boys as well girls to stay in school as long as possible.

Table V–12. Parents' Education Level and Its Influence on Technical Middle School Students Who Benefit from *Oportunidades*

	Mother's Education Level*					Total
	No School	Elementary School	Middle School	High School	College/University	
No high school plans	2	0	1	0	2	5
High School plans	4	11	13	2	0	30
Total	6	11	14	2	2	35
	Father's Education Level**					Total
	No School	Elementary School	Middle School	High School	College/University	
No high school plans	2	1	0	0	2	5
High School plans	7	8	12	1	1	29
Total	9	9	12	1	3	34

NOTE: Total varies because one student with plans to go on to high school did not indicate his or her father's education level. Several students indicated that a parent had passed away or was no longer living with the family. There are 25 technical middle school students who benefit from *Oportunidades.*
* Pearson $X^2 = 16.53$, P= .002
** Pearson $X^2 = 9.20$, P= .056

> *Hypothesis 5.4:* High school students who benefit from *Oportunidades* are at least as likely as their peers who do not benefit from *Oportunidades* to want to attain a higher level of education than their parents

Of the high school student respondents, 91% of their mothers and 86% of their fathers went only as far as middle school. Another 5% of mothers and 8% of fathers completed high school and more fathers than mothers completed college or a post-high school degree. As for their own expectations, 88% of the high school student respondents indicated that they plan to go on to some institution of higher learning. By making it to the third year of high school, the students overwhelmingly exceeded their parents' academic achievements and appear to be aiming much higher academically. Nearly all respondents, regardless of whether they receive *Oportunidades,* indicated that they saw education as key for a prosperous future.

> *Hypothesis 5.5:* Male high school students who benefit from *Oportunidades* will be at least as likely as their peers who do not benefit from *Oportunidades* to seek nonagricultural jobs

The size of the surveyed population that is male, in high school, and indicated a career is small (N=35), yet revealing. Only one student planned to pursue a level-1 occupation (those jobs that are agricultural in nature). Level-2 jobs could be agricultural in nature as well (a rancher or farmer), but not one student indicated plans to pursue a level-2 occupation. The overwhelming majority of students, 86%, indicated that they wanted level-3 or level-4 jobs showing that in fact, all students, regardless of whether or not they benefit from *Oportunidades*, are seeking higher paying, more prestigious jobs that require more education.

Hypothesis 5.6: Students who go to technical middle schools are more likely to plan to go on to high school than students who go to *telesecundaria* middle schools

Of the students in the technical middle school who responded to the survey and answered the questions about their educational plans (N=62), 89% planned to go on to high school. All *telesecundaria* students (N=37) answered the survey questions and 81% plan to continue on to high school. There is no statistical difference between the two groups. What the surveys did reveal is that the students in Calnali's technical middle school mostly planned to pursue high school at the CECyTEH while those in Papatlatla planned to go the COBAEH, a lower quality high school. Isolating the career expectations of the students at each middle school was also not statistically different; most students want level-4 or level-5 jobs. Only a longitudinal study would allow us to see if students actually do what they claim they are going to do and where their goals take them.

Section 5.8. Conclusion

Without the demand-side policy of *Oportunidades*, most of the students at the rural schools surveyed for this chapter would not be able to afford investing in education. Living in poverty and having parents who have not gone past a middle-school education limits students in many ways. What the analysis presented here shows is that the investment in the poorest families has been paying off so that these students' academic and professional choices are beginning to mirror those students who have more advantages.

First we saw that middle school students who benefit from *Oportunidades* in Calnali, Hidalgo in Mexico are just as likely and in some cases more likely than non-beneficiaries to pursue a high school degree. Second, females are becoming just as likely as their male classmates to pursue high school and even more likely to pursue a higher level degree. This is significant for the next generation of students who should benefit from having more educated mothers. Previous studies have addressed how *Oportunidades* has helped girls stay in middle school and this study extends that discussion to how *Oportunidades* impacts girls' plans once they are in high school. One high school nursing student who responded to the survey wrote that she wants to "work in a health center, [and] also to study to specialize in something so that when I form a family they receive the best."[62] This particular student's mother is a stay at home mom and her father had been a day laborer but had recently passed away. Both of her parents had only finished elementary school. Clearly she has embraced the importance of continuing her education so that she can provide for her future children.

Since most parents in this region did not finish middle school, students who are completing middle and high school are surpassing them and *Oportunidades* is helping to make that possible – adding to Mexico's overall level of human capital. The type of jobs students plan to pursue also surpasses their parents' careers in terms of educational requirements, prestige, and salary. All students in this region, not just male high school students, are less likely to pursue work in agriculture. While it is not possible to know what happens to these students without a more complete longitudinal study, it will be

[62] Translated from the Spanish.

worthwhile to follow what happens economically in the region over the next ten years to see if these policies are having an impact in the aggregate.

In conclusion, so long as the demand-side policies continue to aid the poorest families so that sending their children to school remains their best economic option, Mexico can focus its monies on the serious supply-side issues it faces including the quality of the schools and teachers. Based on the findings in Chapter IV, we can also conclude that Mexico needs to localize decision making so that schools can more easily negotiate with officials for the things they need to effectively teach students.

CHAPTER VI

CONCLUSION: INSIGHTS GAINED, SUGGESTIONS FOR FUTURE RESEARCH

What does it mean for a government to invest in education? Is it just spending money on schools and teachers, or does it include family benefits spending that specifically targets parents and their children who will be going to school? This dissertation expands the definition of education spending so that in addition to expenditures allocated to schools (supply-side expenditures), it includes benefits that help families participate in the education system (demand-side expenditures). The simultaneous funding of both schools and family benefits, I argue, contributes both directly and indirectly to the development of a country's level of human capital, or students' level of marketable skills and knowledge. This dissertation presents compelling evidence that both types of expenditures do make a difference for students – especially those coming from the most disadvantaged circumstances.

In the introduction to this dissertation, I presented Figure I-1 as a response to W. Norton Grubb's call for a new model of schooling (Grubb 2009). The model I developed shows how education spending is interconnected with political institutions and with the ideology of government leadership (Chapter III). The model also indicates that spending policies can have an incentivizing influence on families to send their students to school as well as on the students who go, and funding can also have an effect on the quality of

the schools themselves (Chapters IV and V). At the heart of the model is the Education Policy Index (EPI; Chapter II) that captures both traditional school spending as well as family benefits. The approach presented in this dissertation recognizes the necessity of both school (supply-side) and family (demand-side) policies for helping students develop their human capital, and the final measure for everyone is how well prepared students are for what awaits them after graduation. My finding that both supply- and demand-side expenditures matter for the development of student skills and knowledge is important because gains in human capital should have positive impacts on individual students' earnings potential, as well as for their country's level of economic growth (Grosh, et al. 2008; Woessmann and Hanushek 2012).

In Chapter II, I introduced the EPI as a spending indicator designed to reveal the balance of a country's expenditures on families relative to schools and teachers; demand-side spending helps students access schools whereas supply-side spending is indicative of the average quality of the country's school system. The balance of these two types of expenditures can be a useful tool for policy-makers who need to get an idea of where fiscal resources are going, and can be used by researchers to assess the impact spending is having on student outcomes. Further, the EPI serves as an innovative measure for comparing how countries fund education and human capital development more broadly. The EPI is also a novel way to assess what political factors are associated with differing levels of education spending.

Countries' level of wealth, inequality, and poverty do not have an impact on the balance of the EPI scores. Rather, as discussed in Chapter III, political factors such as

the country's electoral system, leadership ideology, and labor union power have a strong influence over how redistributive a country's policies will be and thus how much spending will be allocated to demand-side policies. When the electoral system is a proportional representative (PR) system, labor unions are able to influence demand-side spending positively. Moreover, PR systems tend to redistribute more then majoritarian or mixed systems, and left-learning governments also favor more generous demand-side expenditures. Spending on family benefits and students is considered more redistributive than spending on schools where all students, regardless of their family background or wealth, can go to learn. One advantage of the EPI in analytical models is that it can help identify which students are, based on demand-side benefits, making gains through the school system.

An analysis in Chapter II shows that the rate of student resilience, the percentage of students from a country's bottom quartile on the SES spectrum to score in the top quartile on the 2009 Programme for International Assessment (PISA) exam, was positively correlated with higher EPI scores, i.e. higher investments in supply-side items like school infrastructure. This finding indicates that supply-side spending in the aggregate can make a difference for less advantaged students.

This is confirmed in Chapter IV when I analyze the impact of the EPI-M on PISA exam results. The EPI-M, the ratio of supply-side spending to means-tested demand-side spending only (see Chapter II for details), was positively correlated with reading, science, and math PISA scores. When the three components of supply-side spending were unpacked, spending on teachers' compensation and non-compensation

expenditures had a positive impact on reading and math scores, while capital expenditures positively impacted student performance on each of the PISA exams. School expenditures thus appear to help disadvantaged students develop their human capital as measured by exam performance. However, the two middle-income countries in the dataset with a high EPI, Mexico and Brazil, are not getting desirable results on the PISA exams despite a strong investment in schools and teachers. The spending on schools is evidently not producing results; one contributing factor may be corruption with respect to expenditures on school infrastructures and teacher salaries.[63] A more detailed investigation of where the money actually goes in these countries would help to reveal spending inefficiencies.

The findings in this dissertation support the argument that formal schooling can help students across the SES spectrum gain useful skills and knowledge (Hedges, et al. 1994; Nye, et al. 2004). If schools are important, then it is key that students actually go to school. In Chapter V, which provided case studies of three schools in a poor municipality, Calnali, in rural Mexico, many students benefit from a federal means-tested conditional cash transfer (CCT) program called *Oportunidades* that benefits about a quarter of Mexico's population. To receive benefits, families must meet a myriad of requirements that include getting their students to school 85% of the time. Students

[63] Several measures of corruption confirm that within the dataset used throughout the dissertation, Brazil and Mexico have the highest levels of corruption. The measures are Transparency International's Corruption Perceptions Index and the Political Risk Services group's International Country Risk Guide indicator of Quality of Government that combines corruption, law and order, and bureaucracy quality measures. In February 2013, Elba Esther Gordillo, the head of the Mexican teachers' union, *Sindicato Nacional de Trabajadores de la Educación*, or SNTE, was arrested on embezzlement charges adding to concerns that the teachers union in particular is misusing funds.

receiving *Oportunidades* in Calnali overwhelmingly indicated that they would not be able to attend middle or high school were it not for fiscal assistance. Indeed, across countries, demand-side spending is positively correlated with enrollment rates (Chapter IV).

Further, in the case studies presented in Chapter V, the student beneficiaries of the means-tested cash benefits indicate on surveys that their academic and professional goals are comparable to those of their more advantaged classmates; in some cases their plans even exceed those of their classmates. Girls, even more than boys, are positively impacted by such expenditures and have greater academic expectations. With the known influence of mothers' level of education on their children's futures, this has the potential to increase levels of human capital development in Mexico (Magnuson 2007).

Section 6.1. Suggestions for Future Research

This dissertation shows the utility of measuring education expenditures in a way that includes both supply- and demand-side spending, which is a novel contribution to a literature that has long measured education spending as only supply-side spending. However, this project also leaves many questions unanswered and points to many fruitful directions for further research.

If more nuanced spending measures were available at the national level so that the supply-side and demand-side expenditures could be unpacked even further, we could better understand how these spending initiatives matter. For example, gross teacher compensation levels could reflect that either fewer teachers are paid more, or that there

are more teachers being paid less. These distinctions are not possible with the data used throughout this dissertation. Further, due to the nature of the data available (i.e., the countries that participate in the PISA exams and that make government expenditures data available), I sampled only wealthy and high-middle income countries. Studying the full spectrum of global economic development would allow greater exploration of how both demand- and supply-side spending interact and impact student performance in cases where a large percentage of students would not be likely to enroll in, or stay in school if the government did not aggressively make policy to include them. In less developed countries especially such policies are often influenced by investments from international sources such as the World Bank or the International Monetary Fund.

Most of the countries in this dataset are wealthy and only four (Turkey, Mexico, Chile, and Brazil) have major loans from the World Bank, other countries, or other international monetary funding sources. These loans are important for funding the means-tested demand-side programs, such as conditional cash transfers, that are part of the EPI. Many other countries have adopted similar cash transfer programs that target getting children to enroll in, and stay in school, so there are additional countries that could be included in future analyses, though most of those countries are not participants in the PISA testing program and data from these countries are not always available due to a lack of fiscal transparency.

A longitudinal study that would follow students from middle through high school, and on to either vocational school or university, and finally into the workplace, would provide a great deal more insight into how much human capital is being

developed within these institutions. Vocational schools are especially germane to this research topic given their intent to train students for specific careers. A possible model is the National Child Development Study in Great Britain that follows a cohort of children who were born in one week in 1958. By the age of 16, students from this cohort were able to fairly accurately predict their first job after graduating from school (Brown, et al. 2011). Such a dataset in a country with available government expenditures data would make it possible to assess the effectiveness of different spending categories on human capital development.

In Chapter IV I extended the research on human capital development from strict measures of spending to the level of government that actually makes education policy decisions. Concentration of decision making at the national level clearly showed a negative impact on PISA exam results, while decision-making at the local was the most promising for student outcomes. It would be interesting to delve further into this finding and to interview local-level decision makers in countries that are having the best success.

Finally, there are two things that were not incorporated into the EPI: taxation policy and private expenditures on public institutions. The EPI did not, for example, account for tax credits as part of a voucher system that helps fund families sending their children to government-dependent private schools (as in Germany and Portugal). Future constructions of the EPI should find ways to account for these variations between countries since these differences may impact the balance of spending.

United Nations Secretary-General Ban Ki-Moon wrote "The power of education to transform lives is universal. When you ask parents what they want for their children—

even in war zones and disaster areas—they seek the same thing first: education. Parents want their children in school" (Ki-moon September 2012). To meet this demand, governments can allocate funds to families in their society that most need support, and simultaneously make sure that the schools students experience are worth the effort to get there. Both investments are necessary for a thriving economy and a self-sustaining population. This dissertation contributes to our understanding of how the "package" of education spending, broadly defined, impacts students and by extension human capital development.

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APPENDICES

Appendix A. Family Benefits and Financial Aid by Country, 2006

AUSTRALIA	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Family tax benefit (Part A and B)	X	
Parenting payment (Single and Partnered)	X	
Maternity and parental leave		
Maternity immunization allowance	X	
Baby Bonus (previously Maternity payment)	X	
Other cash benefits		
Partner allowance	X	
Benefits in kind		
Day care / Home-help services		
Child care for eligible parents undergoing training via the Jobs, Education and Training Program, or JET	X	X
Support for child care	X	X
Support for child care: specific purpose payment	X	X
Child care benefit	X	X
Child care (pre-primary education)	X	
Child care (pre-primary education - 4-5yo)	X	
Other benefits in kind		
Child abuse prevention	X	
Grants to family relationship support organizations	X	X
National illicit drug strategy	X	
Services for families with children	X	X
Stronger families and communities strategy: families initiative	X	X
Services for families with children: specific purpose payment	X	X
Family and child welfare - State and Territory	X	X
FINANCIAL AID for primary and secondary school students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Some programs that may be worth investigating in future research are the Household organizational management expenses (HOME) program, social housing subsidy program, rent assistance, other welfare services, unaccompanied humanitarian minors, family and community network initiative, and the stronger families and communities strategy - local answers.

Appendix A, continued

AUSTRIA	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Child benefit (tax system)	X	
Child benefit (Öffenliche Hand)	X	
Child benefit (Sozialleistungen der Länder)	X	
Alimony supplements (Familienlastenausgleichsfonds)	X	
Family support (egalitarian benefits)	X	
Family allowance (Länder) (non means-tested)	X	
Maternity and parental leave		
Maternity/parental leave benefit	X	
Maternity/parental leave benefit (means-tested)	X	X
Aid at child birth	X	
Parental leave (Familien-lastenaus-gleichsfonds)	X	
Other cash benefits		
Other benefits in cash (Familienlastenausgleichsfonds)	X	
Other benefits in cash (Länder)	X	
Other cash lump sum benefits	X	
Benefits in kind		
Day care / Home-help services	X	
Child day care (Kindergarten)	X	
Child day care (Kindergarten) (Sozialleis-tungen der Länder)	X	
Child day care (pre-primary - adjustment for 6yo)	X	
Family accommodation benefits (Sozialleistungen der Länder)	X	
Accommodation benefits (means-tested)	X	X
Home help	X	
Home help (means-tested)	X	X
Other benefits in kind		
Other benefits in kind (Sozialleistungen der Länder)	X	
Family support (Familienlastenausgleichsfonds)	X	
Other benefits in kind (non means-tested)	X	
Other benefits in kind (means-tested)	X	X
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Some programs that may be worth investigating in future research are the rent subsidy (Wohnbeihilfen)s, other cash lump sum benefits (Länder means-tested), accommodation (Länder means-tested and non means-tested), and other benefits in kind (Sozialleis-tungen der Gemeinden means-tested).

Appendix A, continued

BELGIUM	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
National office for employees' family allowances	X	
Self-employed persons (INASTI)	X	
Employees of public enterprises	X	
National social security office for provincial and local government	X	
Employees of local government enterprises	X	
Employees of hospital welfare centres (CPAS)	X	
Employees of Belgocontrol	X	
Postal services employees (PTT-La Poste)	X	
Civil servants and comparable categories, military and police members	X	
Overseas social security office	X	
Family allowances (means-tested)	X	X
Maternity and parental leave		
Parental leave: employees of local government enterprises	X	
Other parental leave	X	
Maintenance income: employed persons (INAMI & INASTI)	X	
Income maintenance: civil servants and comparable categories, military and police members	X	
Birth grant: National office for employees' family allowances	X	
Birth grant: self-employed persons (INASTI)	X	
Birth grant: employees of public enterprises	X	
Birth grant: National social security office for provincial and local government	X	
Birth grant: Postal services employees (PTT-La Poste)	X	
Birth grant: assistance to welfare centres (CPAS)	X	X
Birth grant: civil servants and comparable categories, military and police members	X	

Appendix A, continued

BELGIUM, continued	Total Demand-side Spending	Means-Tested Demand-side Spending
Birth grant (not means-tested)	X	
Birth grant (means-tested)	X	X
Other cash benefits		
Other cash periodic benefits	X	
Benefits in kind		
Day care / Home-help services		
Home-help services	X	
Child day care: all residents	X	
Child care (pre-primary education)	X	
Accommodation: all residents	X	
Home-help: private-sector employees	X	
Other benefits in kind		
Other benefits in kind: assistance to welfare centres (CPAS) and others	X	X
Other benefits in kind (not means-tested)	X	
Other benefits in kind: Belgian Railways employees (SNCB)	X	
Other benefits in kind: private-sector employees (pension provision)	X	
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Some programs that may be worth investigating in future research are: Social housing and Other cash benefits: Income Maintenance, assistance to welfare centres (CPAS).

Appendix A, continued

BRAZIL	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash Benefits		
Bolsa Familia	X	X
Benefits in Kind		
Social Assistance	X	X
FINANCIAL AID to students in primary and secondary school	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. The OECD's SOCX database did not contain data for family benefits in Brazil because data are not centralized (municipalities bear most of the fiscal responsibility for social programs). Data for the Conditional Cash Transfer program, *Bolsa Familia*, as well as social assistance spending (the Social Assistance Reference Centres or CRAS and the Comprehensive Family Care Programme or PAIF) were available from Soares 2012, Soares et al. 2010, and Lindert et al. 2007. Other major social assistance programs available in Brazil that are not family-focused include the Continuous Cash Benefit (BPC) which targets the disabled and the elderly (anyone 65 or older) and the General Social Security Regime (RGPS) that employers and employees pay into.

Appendix A, continued

CANADA	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Canada Child Tax Benefit	X	
Maternity and parental leave		
Related family benefits (Parental) (EI)	X	
Related family benefits (Compassionate Care) (EI)	X	
Québec maternity and parental leave program	X	
Benefits in kind		
Day care / Home-help services		
Provincial/territorial regulated childcare allocation	X	X
FINANCIAL AID for primary and secondary students	N/A	N/A

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Some programs that may be worth investigating in future research are housing programs, provincial welfare programs, and net municipal welfare. Canada also does not offer financial aid for primary and secondary students.

Appendix A, continued

CHILE				Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS					
	Cash benefits				
		Family allowances			
			Family allocations (tax benefits)	X	
			Extraordinary Bonds	X	
			Life Insurance	X	
			Family subsidies	X	X
			Chile Solidario (CCT Program)	X	X
		Maternity and parental leave			
			Maternal Subsidies	X	
	Benefits in kind				
		Day care / Home-help services			
			Child day-care: Pre-school education	X	
FINANCIAL AID to students in primary and secondary school				X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Chile has seen a marked decrease in poverty and has increased social spending on housing and other social welfare initiatives but these data were not available for 2006. The data for *Chile Solidario* comes from three sources: Guardia et al. 2011, Fiszbein and Schady 2009, and the OECD publication "Maintaining Momentum: OECD Perspectives on Policy Challenges in Chile" (OECD 2011d).

Appendix A, continued

CZECH REPUBLIC	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
All residents: children's allowance (income based)	X	X
Maternity and parental leave		
Child-birth grant	X	
Parental allowance	X	
Income maintenance in the event of childbirth: employed	X	
Income maintenance in the event of childbirth: self employed	X	
Income maintenance in the event of childbirth	X	
Other cash benefits		
Social allowance	X	X
State social benefits		
Other cash benefits (Employer's contributions)		
Other cash benefits (non means-tested)		
Other cash benefits (means-tested)	X	X
Benefits in kind		
Day care / Home-help services		
Child day care (regions/municipalities)	X	
Child care (pre-primary education)	X	
Child day care (pre-primary - adjustment for 6yo)	X	
Accommodation	X	
FINANCIAL AID to students in primary and secondary school	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Some programs that may be worth investigating in future research are the housing allowance and income maintenance social assistance.

Appendix A, continued

DENMARK	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Child family benefit	X	
Child maintenance benefit paid in advance	X	X
Maternity and parental leave		
Income maintenance benefit in the event of childbirth	X	
Parental leave benefits	X	
Benefits in kind		
Day care / Home-help services		
Institutions and family care	X	
Child day care	X	
Child day care (adjustment for 6yo)	X	
Home help for families	X	
Other benefits in kind		
Other benefits in kind	X	
FINANCIAL AID to students in primary and secondary school	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Some programs that may be worth investigating in future research include: Social housing benefits and benefits in kind - social assistance family allowances accommodation.

Appendix A, continued

ESTONIA	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Family allowance (non means tested) (Social Insurance Board)	X	
Maternity and parental leave		
Income maintenance (Social Insurance Board)	X	X
Parental leave (Social Insurance Board) - income based but has a base amount for parents who were unemployed the year preceding the child's birth	X	
Birth grant (Social Insurance Board)	X	
Other cash benefits		
Other cash periodic benefits (non means tested) (State)	X	
Other cash lump sum benefits (Social Insurance Board)	X	X
Benefits in kind		
Day care / Home-help services		
Accommodation (non means tested) (Ministry of Social Affairs)	X	
Child day care (adjustment for 6yo)	X	
Child care (pre-primary education)	X	
Other benefits in kind		
Other benefits in kind (non means-tested) - in 2007 this is split between the Social Insurance Board and the Ministry of Social Affairs. In 2006 these are combined.	X	
FINANCIAL AID to students in primary and secondary school	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that are means-tested and may assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. The means-tested benefits that may be worth investigating in future research include social housing and rent benefits, and income support cash benefits from the Ministry of Social Affairs.

Appendix A, continued

FINLAND	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Child allowance	X	
Maternity and parental leave		
Maternity grant (maternity benefit)	X	
Parental leave benefit non means-tested (Child home care allowance)	X	
Parental leave benefit (Municipal supplements to child day care subsidies)	X	X
Other cash benefits		
Maintenance support (health care and social services)	X	
Other cash benefits (Sickness insurance)	X	
Benefits in kind		
Day care / Home-help services		
Child day care (Services provided by municipalities) (non means-tested)	X	
Child day care (Services provided by municipalities) (means-tested)	X	X
Child day care (Municipal supplements to child day care subsidies)	X	X
Help at home	X	
Other benefits in kind		
Institutional care of children and youth	X	
Other benefits in kind (health care and social services)	X	
Other benefits in kind (The Slot Machine Association)	X	
Parental leave benefit means-tested (Child home care allowance)	X	X
Income maintenance (Sickness insurance)	X	
FINANCIAL AID to primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that are means-tested and may assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. The benefits that may be worth investigating in future research include housing allowances, income support, and special support provided by the state in the form of benefits in kind or cash benefits.

Appendix A, continued

FRANCE	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Child allowances: CNAF (not means tested)	X	
Child allowances: State	X	
Child allowances: Civil servants	X	
Child allowances: Miscellaneous central government agencies employees (ODAC)	X	
Child allowances: Local governments employees	X	
Child allowances: Social security employees	X	
Child allowances: Public hospital employees	X	
Other cash lump sum benefits: agricultural employees	X	
Other cash lump sum benefits: State (means-tested)	X	X
Other cash lump sum benefits: Local government (APUL) (means-tested)	X	X
Institutions de prévoyance	X	
Maternity and parental leave		
Employees and other insured persons: CNAMTS, general scheme (social security)	X	
Income maintenance: other bodies	X	
Income maintenance: Agricultural employees	X	
Parental leave benefit (CNAF)	X	
Income maintenance: Miners (CANSSM)	X	
Income maintenance: Seamen (ENIM)	X	
Income maintenance: Notaries' clerks (CRPCEN)	X	
Income maintenance: Chambre of Commerce of Paris employees (CCIP)	X	
Birth grant: CNAF (means-tested)	X	X
Birth grant: Social regime for the self-employed (RSI) (Non means-tested)	X	
Other cash benefits		
Other cash lump sum benefits: Social regime for the self-employed (RSI) (non means-tested)	X	

Appendix A, continued

FRANCE, continued	Total Demand-side Spending	Means-Tested Demand-side Spending
Benefits in kind		Benefits in kind
Day care / Home-help services		
Child care: CNAF (means tested)	X	X
Child care: CRPEN (means tested)	X	X
Child care: State (means-tested)	X	X
Child care: Local government (APUL) (means-tested)	X	X
Pre-primary education	X	
Child care: Civil servants (means tested)	X	X
Child care: National Family Allowances Fund Caisse (Caisse Nationale des Allocations Familiales (CNAF))	X	
Home help: CNAF (means-tested)	X	X
Home help: Caisse nationale militaire de sécurité sociale (CNMSS)	X	
Home help: Local government (APUL)	X	
Home help: Notaries' clerks (CRPCEN)	X	
Other benefits in kind		
Other benefits in kind: Caisse nationale militaire de sécurité sociale (CNMSS) (means-tested)	X	X
Other benefits in kind: Local government employees (CNRACL)	X	
Other benefits in kind: ARRCO	X	
Other benefits in kind: State (non means-tested)	X	
Other benefits in kind: Local government (APUL) (non means-tested)	X	
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There may be other HOUSING and SOCIAL POLICY AREA expenditures that may assist families but it is not clear if such initiatives impact helping students get to school.

Appendix A, continued

GERMANY	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Family allowance (Statutory pension insurance)	X	
Family allowance (Child benefit)	X	
Public transfers to support families with children	X	
Family allowance (Social compensation, assistance to war victims) (non means-tested)	X	
Family allowance (Social compensation, assistance to war victims) (means-tested)	X	X
Family allowance (Family supplements on wages for civil servants)	X	
Family allowance (UV)	X	
Family allowance (Social assistance)	X	X
Family allowance for farmers	X	
Family allowance (ALG II)	X	
Maternity and parental leave		
Parental leave benefits (KV)	X	
Parental leave benefits (ALG II)	X	
Parental leave benefits (means-tested) Child-raising allowance	X	X
Other cash benefits		
Other cash benefits (Pension insurance for independent professions)	X	
Other cash benefits (Social compensation, assistance to war victims, unemployment assistance)	X	
Other cash benefits (Social assistance)	X	X
Other cash benefits (other compensations)	X	
Other cash benefits (BAFöG)	X	

Appendix A, continued

GERMANY, continued	Total Demand-side Spending	Means-Tested Demand-side Spending
Benefits in kind		
Day care / Home-help services		
Child day care (Youth assistance)	X	
Child day care (pre-primary - adjustment for 6yo)	X	
Other benefits in kind		
Youth assistance	X	
Social assistance	X	X
FINANCIAL AID to students in primary and secondary school	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that are means-tested and may assist families but it is not clear if such initiatives impact helping students get to school. Benefits that may be worth investigating in future research include housing assistance cash benefits, income support social assistance, and other social assistance cash benefits and benefits in kind.

Appendix A, continued

HUNGARY	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Family or child allowance (non means-tested)	X	
Family or child allowance (means-tested)	X	X
Birth grant (non means-tested)	X	
Maternity and parental leave		
Income maintenance in the event of childbirth (non means-tested)	X	
Parental leave benefit (non means-tested)	X	
Other cash benefits		
Other cash periodic benefits (means-tested)	X	X
Other cash lump sum benefits (means-tested)	X	X
Other cash periodic benefits (GYV-GYJO)	X	
Other cash lump sum benefits (non means-tested)	X	
Benefits in kind		
Day care / Home-help services		
Child day care (non means-tested)	X	
Child care (pre-primary education)	X	
Other benefits in kind		
Accommodation (non means-tested)	X	
Other benefits in kind (non means-tested)	X	
Other benefits in kind (means-tested)	X	X
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that are means-tested and may assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that are means-tested and may be worth investigating in future research include housing assistance (rent benefits and benefits to owner-occupiers), income maintenance/income support, other cash periodic benefits, cash lump sum benefits, and other means-tested benefits in kind.

Appendix A, continued

ICELAND	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Family allowances	X	X
Maternity and parental leave		
Maternity/Paternity Leave Fund	X	
Other cash benefits		
Other cash periodic benefits: Communal Alimony Collection Centre	X	
Benefits in kind		
Day care / Home-help services		
Municipal child day-care services	X	
Municipal home-help services	X	
Other benefits in kind		
Social assistance, children welfare, institutions for addicts: accommodation	X	X
Municipal youth services: other benefits in kind	X	
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that may be worth investigating in future research include social housing assistance (benefits in kind) and income maintenance/children welfare cash benefits.

Appendix A, continued

IRELAND	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
All residents: standard child benefit	X	
Children's allowance for civil servants: teachers, army	X	
Family allowance (non-contributory)	X	
Family allowance (social insurance fund)	X	
All residents: family income supplement	X	X
Maternity and parental leave		
Employees: maternity benefits (social security) (3)	X	
Income maintenance (Health benefits)	X	
Other cash benefits		
Deserted wives' allowance	X	
All residents: lone parent's allowance	X	
Cash benefits by Health services	X	
Other cash benefits: employees	X	X
Benefits in kind		
Day care / Home-help services		
Child care (pre-primary education)	X	
Accommodation	X	
Home help	X	
Other benefits in kind		
Family allowances through national health services	X	
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that may be worth investigating in future research include social housing assistance (benefits in kind) and income maintenance/children welfare cash benefits.

Appendix A, continued

ISRAEL	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Child allowance (NII)	X	
Study grant (NII) - to help school-age children buy school equipment (means-tested)	X	X
Alimony (NII)	X	
Maternity and parental leave		
Maternity allowance and vacation pay (NII)	X	
Other cash benefits		
Cash benefits for needy families	X	X
Birth grant (NII)	X	
Benefits in kind		
Day care / Home-help services		
Local authorities day care programs	X	
Child care programs (NPIs)	X	
Pre-primary educational institutions	X	
Other benefits in kind		
Child and family welfare services	X	X
Rehabilitation programs for youth	X	X
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that may be worth investigating in future research include housing assistance, cash benefits for the socially excluded and needy, the earned income tax credit, assistance to the socially excluded and new immigrants, food provisions to the needy, philanthropy funds, and subsidized public transportation.

Appendix A, continued

ITALY	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Family or child allowances (means-tested)	X	X
Family or child allowances (means-tested): Employees' temporary benefits [managed by INPS]	X	X
Family or child allowances (means-tested): Social Security Funds for professional categories	X	X
Family or child allowances (means-tested): Occupational Injury Insurance [managed by INAIL]	X	X
Maternity and parental leave		
Income in the event of childbirth (non means-tested)	X	
Income in the event of childbirth (means-tested)	X	X
Other cash benefits		
Other cash periodic benefits (means-tested)	X	X
Benefits in kind		
Day care / Home-help services		
Child care (pre-primary education)	X	
Child day care	X	
Other benefits in kind		
Other benefits in kind for family (non means-tested)	X	
Other benefits in kind for family (means-tested)	X	X
Accommodation for family		
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that may be worth investigating in future research include housing assistance and income maintenance, as well as mandatory private cash benefits such as the means-tested compulsory occupational social insurance that is managed by public sector employers.

Appendix A, continued

JAPAN	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Children's allowances	X	
Rearing allowances for handicapped children	X	
Allowances for children in lone parents' family	X	
Maternity and parental leave		
Maternity allowance: Japan Health Insurance Association	X	
Maternity allowance: society managed health insurance	X	
Maternity allowance: National health insurance	X	
Maternity allowance: seamen's insurance	X	
Maternity allowance: Promotion and Mutual Aid corporation for Private Schools of Japan (Former Mutual aid association of private school personnel)	X	
Maternity allowance: National public service mutual aid association	X	
Maternity allowance: local public employees' mutual aid association	X	
Maternity allowance: unemployment insurance	X	
Other cash benefits		
Local public employees' mutual aid association	X	
Benefits in kind		
Day care / Home-help services		
Children's allowances	X	
Social welfare (subsidies for children's protection)	X	X
Child care (pre-primary education)	X	
Other benefits in kind		
Children's allowances (other)	X	
Social welfare (subsidies for children's protection, other)	X	X
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that may be worth investigating in future research include income maintenance cash benefits for public assistance and social welfare.

Appendix A, continued

KOREA	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Lone parent families	X	
Patriots and veteran pension, etc.	X	
Maternity and parental leave		
Prenatal and postnatal leave allowances (Employment Insurance)	X	
Maternity leave allowances (Employment Insurance)	X	
Benefits in kind		
Day care / Home-help services		
Day care for child & adolescent	X	
Pre-school education only	X	
Child care (pre-primary education)	X	
Support for day care for family	X	X
Other benefits in kind		
Welfare centers	X	X
Children facilities	X	
Family welfare	X	X
Residential service for women & families	X	
Sub-other	X	
FINANCIAL AID for primary and secondary students	X	X

NOES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that may be worth investigating in future research include food bank social assistance, price reductions for low-income families, and public housing costs for low-income families. Mandatory private benefits-in-kind that may have an impact on students in particular is the transportation and telecommunication fee reduction (for children).

Appendix A, continued

MEXICO	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Other cash benefits		
Education, health and feeding national program: PROGRESA/Oportunidades (SEDESOL, The Ministry of Social Development)	X	X
Nutritional Support Program (SEDESOL)	X	X
Benefits in kind		
Day care / Home-help services		
Child day care institutions (ISSSTE, Social and Security Services for State Workers)	X	X
Child day care institutions (IMSS, Mexican Social Healthcare Institute)	X	X
Child care (pre-primary education)	X	
Home-help services to children (abandoned or abused children, DIF)	X	X
Other benefits in kind		
Food to families program (DIF)	X	X
Food program school breakfast (DIF)	X	X
Social milk program (SEDESOL)	X	X
Sports promotion (ISSSTE)	X	X
Rural Supply Program (SEDESOL-DICONSA)	X	X
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. Nearly all of Mexico's programs target the poor given the rate of poverty in the country. The World Bank estimates that about 43% of the Mexican population lived at or below the poverty line in 2006 (World Bank 2012a). The only benefit not considered means-tested is the pre-primary education child care since it is available to everyone. Yet, since most wealthy families opt to sent their children to private schools, even this benefit is really more of a help to poor families. There are other HOUSING and SOCIAL POLICY AREA expenditures that may also assist poor families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that may be worth investigating in future research include the rural housing program and worthy housing initiative sponsored by the Ministry of Social Development or SEDESOL, as well as the social housing credit provided by the National Trust fund for Popular Housing or FONHAPO.

Appendix A, continued

NETHERLANDS	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
All residents: child allowance	X	
Maternity and parental leave	X	
Other cash benefits		
Other periodic cash benefits	X	
Benefits in kind		
Day care / Home-help services		
All residents: family help and care, home help financed through AWBZ	X	
Child care (pre-primary education)	X	
Child day care (non means-tested)	X	
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. Starting in 2008 a means-tested child allowance cash benefit was introduced. Only 2006 benefits are listed here though the means-tested benefit is included for the 2006-2009 EPI averages. There are other HOUSING and SOCIAL POLICY AREA expenditures that may also help families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that may be worth investigating in future research include social provisions to the poor.

Appendix A, continued

NEW ZEALAND	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Family (Support) Tax Credit	X	X
Child Tax Credit	X	X
Parental Tax Credit	X	
In Work Payment	X	
Minimum Family Tax Credit	X	
Maternity and parental leave		
Maternity and parental leave	X	
Other cash benefits		
Domestic Purposes Benefit for sole parents	X	
Benefits in kind		
Day care / Home-help services		
Childcare Assistance	X	X
Out of school care and recreation (OSCAR)	X	
Early Childhood Education Subsidies	X	X
Early Childhood Education Grants	X	X
Child care (pre-primary education: 5 years old)	X	
Other benefits in kind		
Commissioner for children	X	
Education and prevention services	X	X
Family wellbeing services	X	X
Counseling and rehabilitation services	X	
Families Commission	X	
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may also assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that may be worth investigating in future research include housing assistance, community housing rental subsidies, strong families benefits in kind, and the youth development partnership fund.

Appendix A, continued

NORWAY	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Family allowances for children	X	
Maternity and parental leave		
Maternity and parental leave benefits	X	
Income maintenance in the event of childbirth	X	
Birth grant	X	
Other cash benefits		
Lone parent cash benefit	X	
Benefits in kind		
Day care / Home-help services		
Child day care institutions	X	
Other benefits in kind		
Accommodation	X	X
Other benefits in kind	X	X
Home help	X	
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may also assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that may be worth investigating in future research include means-tested income support cash benefits, as well as social assistance and means-tested accommodation benefits in kind.

Appendix A, continued

POLAND	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Family allowances for children	X	
Maternity and parental leave		
Parental leave (non means-tested)	X	
Parental leave (means-tested)	X	X
Birth grant	X	
Income maintenance in the event of childbirth	X	
Other cash benefits		
Other cash periodic benefits (social assistance)	X	X
Other cash periodic benefits (means-tested)	X	X
Benefits in kind		
Day care / Home-help services		
Child care (pre-primary education)	X	
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may also assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that may be worth investigating in future research include means-tested income maintenance cash benefits, social assistance for housing, and accommodation social assistance benefits in kind.

Appendix A, continued

PORTUGAL	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Benefits managed by the central administration	X	
Benefits managed by the local administration	X	
Child allowance (CGA)	X	
Social Security Subsystem for family protection	X	X
Social Security Subsystem for solidarity (means-tested)	X	X
Social services (public sector) (means-tested)	X	X
General retirement fund (civil servants, pensioners)	X	
Maternity and parental leave		
Benefits managed by the central administration	X	
Social Security Subsystem: income maintenance	X	
Social Security Subsystem for solidarity: income maintenance	X	X
Central administration	X	
Other cash benefits		
Social Security Subsystem for family protection	X	
Social Security Subsystem for solidarity	X	
Social Security Subsystem for solidarity (means-tested)	X	X
Benefits managed by the central administration: other cash periodic benefits	X	
Benefits managed by the local administration: other cash periodic benefits	X	
CGA: other cash periodic benefits	X	
Social services (public sector): other cash periodic benefits (non means-tested)	X	
Social services (public sector): other cash periodic benefits (means-tested)	X	X
General retirement fund (civil servants, pensioners): other cash periodic benefits	X	

Appendix A, continued

PORTUGAL, continued	Total Demand-side Spending	Means-Tested Demand-side Spending
Benefits in kind		
Day care / Home-help services		
Social services (public sector) (non means-tested)	X	
Social services (public sector) (means-tested)	X	X
Child care (pre-primary education)	X	
Other benefits in kind		
Social Security Subsystem for solidarity (means-tested)	X	X
Social services (public sector) (non means-tested)	X	
Benefits managed by the local administration	X	
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. Some programs in this category transition so, for example, in 2008 the social security subsystem for solidarity (income maintenance) ends and the social security welfare and social protection program begins. The average EPI for 2006-2009 will capture these changes in the aggregate. Only the active programs in 2006 are listed here. There are other HOUSING and SOCIAL POLICY AREA expenditures that may also assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that may be worth investigating in future research include means-tested income maintenance cash benefits and social services that are tied to housing assistance.

Appendix A, continued

SLOVAK REPUBLIC	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Birth grant (non means-tested)	X	
Family allowances (non means-tested)	X	
Maternity and parental leave		
Financial assistance in maternity (non means-tested)	X	
Parental leave benefits (non means-tested)	X	
Other cash benefits		
Other cash periodic benefits	X	X
Other cash sickness lump sum benefits (non means-tested)	X	
Benefits in kind		
Day care / Home-help services		
Children's homes (non means-tested)	X	
Child care (pre-primary education)	X	
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. Means-tested children allowances were introduced in 2009 along with child day care state social support and other state social support. These additions are accounted for in the average EPI scores but only the benefits paid out in 2006 are listed here. There are other HOUSING and SOCIAL POLICY AREA expenditures that may also assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that may be worth investigating in future research include means-tested social help cash benefits intended for income maintenance and accommodation benefits in kind, as well as mandatory private family benefits in kind.

Appendix A, continued

SLOVENIA	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Other rights from Family Income Act	X	
Maternity and parental leave		
Maternity leave compensation	X	
Parental leave: Maternity leave compensation	X	
Parental leave: Other rights from Family Income Act	X	
Other cash benefits		
Other cash periodic benefits: Other rights from Family Income Act	X	
Other cash lump sum benefits: Other rights from Family Income Act	X	
Benefits in kind		
Day care / Home-help services		
Accommodation: Social welfare	X	X
Child day-care: Pre-school education	X	
Other benefits in kind		
Other rights from Family Income Act	X	
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. In 2007 Slovenia adopted the EURO and in 2009 spending dropped significantly due to the global recession. The family allowance spending data were pulled for this research in April 2012 and confirmation review of the data in February 2013 show changes in these expenditures. The SOCX support team responded to an inquiry and explained that tax credits had been incorporated in the total. The data were updated accordingly. There are other HOUSING and SOCIAL POLICY AREA expenditures that may also assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that may be worth investigating in future research include social welfare spending for income maintenance, social assistance, and other benefits in kind.

Appendix A, continued

SPAIN	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Family allowance: employees and self-employed (social security) (non means-tested)	X	
Family allowance: employees and self-employed (social security) (means-tested)	X	X
Family allowance: civil servants, military personnel and local government employees	X	
Family allowance: other social protection schemes (non means-tested)	X	
Family allowance: companies (non means-tested)	X	
Maternity and parental leave		
Income maintenance for employees and self-employed (social security)	X	
Income maintenance for civil servants, military personnel and local government	X	
Income maintenance (companies)	X	
Birth grant: employees and self-employed (social security)	X	
Birth grant: employees and self-employed (social security) (non means-tested)	X	
Birth grant: employees and self-employed (social security) (means tested)	X	X
Other cash benefits		
Other cash lump-sum benefits (non means-tested)	X	
Other periodic benefits for other social protection schemes (means-tested)	X	X

Appendix A, continued

SPAIN, continued	Total Demand-side Spending	Means-Tested Demand-side Spending
Benefits in kind		
Day care / Home-help services		
Day care: other social protection schemes	X	
Day care: companies	X	
Accommodation: other social protection schemes (means-tested)	X	X
Accommodation: companies (means-tested)	X	X
Home-help: other social protection schemes (means-tested)	X	X
Other benefits in kind		
Other benefits in kind: other social protection schemes (non means-tested)	X	
Other benefits in kind: other social protection schemes (means-tested)	X	X
Other benefits in kind: other social protection schemes (means-tested)	X	X
Other benefits in kind: companies (non means-tested)	X	
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may also assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that may be worth investigating in future research include housing benefits in kind and cash benefits for income maintenance and support for other social protection schemes, and accommodation for social assistance benefits in kind.

Appendix A, continued

SWEDEN	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Family or child allowance	X	
Maternity and parental leave		
Income support during parental leave (operated through "parental insurance" since 1999)	X	
Income maintenance (parental insurance)	X	
Adoption allowance	X	
Other cash benefits		
Other cash benefits	X	
Benefits in kind		
Day care / Home-help services		
Child care	X	
Child day care (adjustment for 6yo)	X	
Child care (pre-primary education)	X	
Accommodation	X	
Child day care (social services bought by local government)	X	X
Accommodation (social services bought by local government)	X	X
Home help	X	
Home help (Privately produced social-services provision) (non means-tested)	X	
Other benefits in kind		
Other benefits in kind	X	
Other benefits in kind (social services bought by local government)	X	X
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY BENEFITS and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may also assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that may be worth investigating in future research include social assistance spending in the areas of income maintenance, accommodation, and other social services.

Appendix A, continued

SWITZERLAND	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Family allowances in agricultural sector (not means tested)	X	
Family allowances in agricultural sector (means tested)	X	X
Family allowances (AF) (cantonal level)	X	
Maternity and parental leave		
Maintenance income: salary paid during maternity leave	X	
Benefits in kind		
Day care / Home-help services		
Child care: youth protection	X	X
Accommodation: youth protection	X	X
Child care (pre-primary education)	X	
FINANCIAL AID to students in primary and secondary school	X	X

NOTES: Only social spending categorized under FAMILY and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Some programs that may be worth investigating in future research includes: Social housing benefits, social assistance rent benefits, maintenance income - scholarships and social assistance, other benefits in kind: social assistance.

Appendix A, continued

TURKEY	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Maternity and parental leave		
Maternity benefits	X	
Social Solidarity Fund - SSF - Conditional Cash Transfer	X	X
Benefits in kind		
Day care / Home-help services		
Household services	X	
FINANCIAL AID to students in primary and secondary school	X	

NOTES: Only social spending categorized under FAMILY and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. Turkey does not provide much social policy expenditure data to the OECD/SOCX database and had included their Conditional Cash Transfer spending (the Social Solidarity Fund or SSF) in FINANCIAL AID. For comparability purposes, this spending was moved to the cash benefits category. There are other POLICY SOCIAL EXPENDITURES (Public cash benefits and public benefits in kind) listed as broad categories and this spending may assist families but it is not clear how much of an impact these initiatives have helping students get to school.

Appendix A, continued

UNITED KINGDOM	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
All residents: child benefit	X	
Maternity and parental leave		
Employees: statutory maternity pay (SMP) (social security)	X	
Income maintenance	X	
Other cash benefits		
Working Tax Credit (cash part, less child care component)	X	
Child Tax credit (cash part)	X	
Lump sum: income support, family credit and social funds (means-tested)	X	X
Periodic: income support, family credit and social funds (means-tested)	X	X
Benefits in kind		
Day care / Home-help services		
Child care pre primary (3 and 4 years old)	X	
Child care component of FC/WFTC/WTC	X	X
Child care pre primary (adjustment for pre-primary education: 5 years old)	X	
Family support: local authority personal social services	X	X
Home help: local authority personal social services	X	X
Other benefits in kind		
All residents: free school milk and/or meals (non means-tested)	X	
All residents: free school milk and/or meals (means-tested)	X	X
All residents: Central Government personal social services	X	X
All residents: welfare foods provision	X	X
Accommodation: Local Authority personal social services	X	X
FINANCIAL AID for primary and secondary students	X	X

NOTES: Only social spending categorized under FAMILY and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and PUBLIC SOCIAL EXPENDITURES that may also assist families but it is not clear how much of an impact these particular initiatives have helping students get to school. Benefits that may be worth investigating in future research include social housing, benefits in kind, public cash benefits, and public benefits in kind.

Appendix A, continued

THE UNITED STATES	Total Demand-side Spending	Means-Tested Demand-side Spending
FAMILY BENEFITS		
Cash benefits		
Family allowances		
Temporary Assistance for Needy Families (TANF)	X	X
Benefits in kind		
Day care / Home-help services		
Child care (pre-primary education)	X	X
Other benefits in kind		
Child welfare: IV-B programs	X	X
Child welfare: IV-E (Foster care programs) (Federal)	X	X
Social Service Block Grant (SSBG)	X	X
Child Care Development Block grant (CCDBG)	X	X
Child Support Enforcement (CSE)	X	
Special Supplemental Nutrition Program for Women, Infants and Children (WIC)	X	X
Child nutrition and special milk programs	X	X
Commodity donations (CSFP and others)	X	X
FINANCIAL AID to students in primary and secondary school	N/A	N/A

NOTES: Only social spending categorized under FAMILY and FINANCIAL AID (to students in primary and secondary schools) are considered for demand-side spending. There are other HOUSING and SOCIAL POLICY AREA expenditures that may help families but it is not clear how much of an impact these particular initiatives have helping students get to school. Some programs that may be worth investigating further include: Food stamps, earned income tax credit (refundable part), and the low-income housing energy assistance program.

Appendix B. Chapter III Hypotheses and Independent Variables Unpacked

Hypotheses	Operationalization	Expected Sign Relative to the EPI (Dependent Variable)*	Data Source
***Hypothesis 3.1*:** Countries that are considered liberal welfare regimes will allocate more resources to schools (supply-side policies) than to family or student benefits (demand-side policies); conservative regimes will allocate funds a bit more evenly whereas univeralist regimes will devote more resources to demand-side policies.	See Table III-1 for country scores. Each score in the capital welfare typology is between 0 and 12 and is based on a variety of stratification indices. Depending on how the country handles pensions, unemployment, etc., it is given a score that indicates to what degree it falls into each category: liberal, conservative, or social democratic	Liberal (+) Conservative (+) Social (-)	*The Three Worlds of Welfare Capitalism*, Gøsta Esping-Andersen (1990) - Table 3.1, 70-1
***Hypothesis 3.2*:** Proportionally Representative (PR) Systems will spend relatively more than majoritarian systems on demand-side policies that are student and family-oriented than on supply-side policies that target schools and teacher wages.	Classification of the electoral system. (1) Majoritarian (2) Combined (mixed) (3) Proportional (PR)	–	Quality of Government database (University of Gothenberg)
***Hypothesis 3.3*:** More democratic countries will invest more in education (supply-side policies) than in family and student benefits (demand-side policies) to assure that citizens are able to participate in the economy as well as the running and monitoring of government.	Each country is scored on its level of political rights and civil liberties. A rating of 1 indicates the highest degree of freedom and 7 the lowest level of freedom. All countries in this dataset are between 1 and 3.	+	Freedom House - Freedom in the World Survey

Appendix B, continued

Hypotheses	Operationalization	Expected Sign Relative to the EPI (Dependent Variable)*	Data Source
***Hypothesis 3.4*:** Left-learning governments will spend more on demand-side policies that are student and family-oriented than on supply-side policies that target schools and teacher wages.	Ideology of the largest party in government OR ideology of the executive's party: (1) Right (2) Center (3) Left	−	The World Bank's Database of Political Institutions
***Hypothesis 3.5*:** When a country has strong unions and a PR (proportionally representative) electoral system, spending on supply-side expenses (schools and wages) would be expected to be higher relative to demand-side spending (expenditures that go directly to students and families).	This is tested with an interaction between the PR measure and the Labor Union Power Index (UP). The UP measures the protection and power of unions on a weighted scale of seven factors that together equal one: (1) Do employees have the right to unionize? (2) Do employees have the right to bargain collectively? (3) Do employees have the legal duty to bargain with unions? (4) Are collective contracts extended to third parties by law? (5) Does the law allow closed shops? (6) Do workers, or unions, or both have a right to appoint members to the Boards of Directors? (7) Are workers' councils mandated by law?	+**	Quality of Government database (University of Gothenberg)

* More demand spending means the EPI will be lower (closer to 0) while more supply spending means that the EPI will be higher (closer to 1)
**The interaction multiplies two negative numbers together so the coefficient will be positive even though the effect is expected to be negative. This is why the interaction coefficient cannot be directly interpreted and a marginal effect figure is necessary (See Figure 3.5).

Appendix C. Elections in 2005 and 2006

Country	Legislative Elections		Executive Elections	
	2005	2006	2005	2006
Australia	0	0	0	0
Austria	0	1	0	0
Belgium	0	0	0	0
Brazil	0	1	0	1
Canada	0	1	0	0
Chile	1	0	1	0
Czech Republic	0	1	0	0
Denmark	1	0	0	0
Estonia	0	0	0	1
Finland	0	0	0	1
France	0	0	0	0
Germany	1	0	0	0
Hungary	0	1	1	0
Iceland	0	0	0	0
Ireland	0	0	0	0
Israel	0	1	0	0
Italy	0	1	0	0
Japan	1	0	0	0
S. Korea	0	0	0	0
Mexico	0	0	0	0
Netherlands	0	1	0	1
New Zealand	1	1	0	0
Norway	1	0	0	0
Poland	1	0	1	0
Portugal	1	0	0	0
Slovak Republic	0	1	0	0
Slovenia	0	0	0	0
Spain	0	0	0	0
Sweden	0	1	0	0
Switzerland	0	0	0	0
Turkey	0	0	0	0
UK	1	0	0	0
United States	0	1	0	0
Total	**9**	**12**	**3**	**4**

Appendix D. What's the difference? Legislative Ideology Versus Executive Ideology

Independent Variables	Model 1		Model 2	
	EPI-A	EPI-M	EPI-A	EPI-M
Executive Ideology	-.05 (.03)*	-.03 (.03)	-	-
Legislative Ideology	-	-	-.05 (.03)*	-.03 (.03)
Electoral System	-.24 (.07)**	-.04 (.08)	-.24 (.07)**	-.04 (.08)
Union Power	-.94 (.29)**	-.04 (.35)	-.94 (.29)**	-.04 (.35)
Electoral System*Union Power	.42 (.13)**	.06 (.15)	.42 (.13)**	.06 (.15)
Freedom Index	.12 (.07)	-.07 (.09)	.12 (.07)	-.07 (.09)
Political Constraint	.01 (.27)	.06 (.32)	.01 (.27)	.06 (.32)
GDPpc	-.00 (.00)*	.00 (.00)	-.00 (.00)	.00 (.00)
Model p-value	**.03**	**.71**	**.03**	**.71**

N=26, Standard errors are in parentheses
*p<.10, ** p<.01

APPENDIX E. PISA Scores Unpacked

Country	School Type	Percent School Type	Percent School Type (SE)	Reading Mean Score	Reading Mean Score (SE)	Math Mean Score	Math Mean Score (SE)	Science Mean Score	Science Mean Score (SE)
Australia	Public	59.72	0.75	497	3.89	499	4.04	511	4.31
Australia	Private	40.28	0.75	542	3.01	537	3.05	552	2.67
Australia	Other	a	a	a	a	a	a	a	a
Australia	All			515	2.30	514	3	527	3
Austria	Public	86.76	2.51	465	3.54	493	3.36	491	3.95
Austria	Private	12.52	2.4	497	13.68	505	13.11	509	11.9
Austria	Other	0.72	0.71	0	0	0	0	0	0
Austria	All			470	2.90	496	3	494	3
Belgium	Public	30.51	0.65	475	4.08	483	4.22	475	4.44
Belgium	Private	69.49	0.65	520	2.93	529	2.71	520	3.18
Belgium	Other	a	a	a	a	a	a	a	a
Belgium	All			506	2.30	515	2	507	3
Brazil	Public	84.91	1.09	398	3.16	373	2.65	393	2.81
Brazil	Private	11.86	0.61	516	6.68	485	6.59	505	5.9
Brazil	Other	3.23	0.89	381	12.58	355	13.51	379	10.32
Brazil	All			412	2.70	386	2	405	2
Canada	Public	92.52	0.67	521	1.51	522	1.68	526	1.67
Canada	Private	7.48	0.67	566	7.15	582	7.24	567	6.97
Canada	Other	a	a	a	a	a	a	a	a
Canada	All			524	1.50	527	2	529	2
Chile	All			449	3.10	421	3	447	3
Chile	Public	40.61	1.61	423	5.17	398	4.66	425	4.45
Chile	Private	56.09	2.06	469	3.9	438	4.36	464	3.95
Chile	Other	3.3	1.72	452	17.94	417	20.51	439	17.57
Czech Republic	Public	95.56	1.2	477	2.99	492	2.95	499	3.21

Appendix E, continued

Country	School Type	Percent School Type	Percent School Type (SE)	Reading Mean Score	Reading Mean Score (SE)	Math Mean Score	Math Mean Score (SE)	Science Mean Score	Science Mean Score (SE)
Czech Republic	Private	3.52	1.03	509	19.77	513	16.42	536	15.22
Czech Republic	Other	0.92	0.65	436	13.77	454	43.7	457	21.6
Czech Republic	All			478	2.90	493	3	500	3
Denmark	Public	77.2	2.77	491	2.23	500	2.74	495	2.52
Denmark	Private	22.8	2.77	508	5.67	514	6.42	515	6.84
Denmark	Other	a	a	a	a	a	a	a	a
Denmark	All			495	2.10	503	3	499	3
Estonia	Public	96.74	1.18	501	2.68	512	2.6	528	2.69
Estonia	Private	3.26	1.18	510	18.87	502	26.1	529	23.23
Estonia	Other	a	a	a	a	a	a	a	a
Estonia	All			501	2.60	512	3	528	3
Finland	Public	96.07	1.16	536	2.2	541	2.15	554	2.31
Finland	Private	3.93	1.16	542	18.68	535	14.11	564	17.22
Finland	Other	a	a	a	a	a	a	a	a
Finland	All			536	2.30	541	2	554	2
France	Public	a	a	a	a	a	a	a	a
France	Private	a	a	a	a	a	a	a	a
France	Other	a	a	a	a	a	a	a	a
France	All			496	3.40	497	3	498	4
Germany	Public	94.93	1.54	497	3.24	512	3.54	520	3.6
Germany	Private	5.07	1.54	513	19.64	533	24.55	537	20.08
Germany	Other	a	a	a	a	a	a	a	a
Germany	All			497	2.70	513	3	520	3
Hungary	Public	87.04	2.53	492	3.73	488	3.93	501	3.73
Hungary	Private	12.96	2.53	507	12.4	507	14.77	515	11.14
Hungary	Other	a	a	a	a	a	a	a	a

Appendix E, continued

Country	School Type	Percent School Type	Percent School Type (SE)	Reading Mean Score	Reading Mean Score (SE)	Math Mean Score	Math Mean Score (SE)	Science Mean Score	Science Mean Score (SE)
Hungary	All			494	3.20	490	4	503	3
Iceland	Public	99.13	0.09	498	1.47	504	1.47	493	1.42
Iceland	Private	0.87	0.09	0	0	0	0	0	0
Iceland	Other	a	a	a	a	a	a	a	a
Iceland	All			500	1.40	507	1	496	1
Ireland	Public	38.5	0.39	474	4.93	472	4.34	489	5.65
Ireland	Private	61.5	0.39	509	3.69	497	3.07	520	3.89
Ireland	Other	a	a	a	a	a	a	a	a
Ireland	All			496	3.00	487	3	508	3
Israel	All			474	3.60	447	3	455	3
Israel	Public	81.61	2.62	470	4.47	443	3.94	451	4.14
Israel	Private	17.78	2.56	498	12.97	471	13	478	11.84
Israel	Other	0.61	0.56	0	0	0	0	0	0
Italy	Public	93.55	0.58	489	1.65	486	2	492	1.9
Italy	Private	5.81	0.63	448	8.96	446	7.25	455	8.13
Italy	Other	0.64	0.29	385	19.24	406	26.32	401	26.01
Italy	All			486	1.60	483	2	489	2
Japan	Public	70.7	1.26	522	4	531	3.8	542	3.8
Japan	Private	29.3	1.26	514	8.13	525	7.68	533	7.74
Japan	Other	a	a	a	a	a	a	a	a
Japan	All			520	3.50	529	3	539	3
Korea	Public	62.62	4.33	533	5.23	542	6.47	535	5.51
Korea	Private	37.38	4.33	549	5.38	554	6.71	544	5.74
Korea	Other	a	a	a	a	a	a	a	a
Korea	All			539	3.50	546	4	538	3
Mexico	Public	88.48	1.14	420	2.09	414	1.86	411	1.82

Appendix E, continued

Country	School Type	Percent School Type	Percent School Type (SE)	Reading Mean Score	Reading Mean Score (SE)	Math Mean Score	Math Mean Score (SE)	Science Mean Score	Science Mean Score (SE)
Mexico	Private	11.52	1.14	468	4.37	457	5.24	456	4.3
Mexico	Other	a	a	a	a	a	a	a	a
Mexico	All			425	2.00	419	2	416	2
Netherlands	Public	33.96	3.89	515	9.59	531	9.8	526	11.73
Netherlands	Private	66.04	3.89	504	8.12	523	7.29	520	7.94
Netherlands	Other	a	a	a	a	a	a	a	a
Netherlands	All			508	5.10	526	5	522	5
New Zealand	Public	94.34	0.43	517	2.31	516	2.36	529	2.57
New Zealand	Private	5.66	0.43	586	10.64	580	8.66	588	11.11
New Zealand	Other	a	a	a	a	a	a	a	a
New Zealand	All			521	2.40	519	2	532	3
Norway	Public	98.63	0.43	503	2.57	498	2.42	500	2.61
Norway	Private	1.37	0.43	465	26.77	454	23.53	456	20.76
Norway	Other	a	a	a	a	a	a	a	a
Norway	All			503	2.60	498	2	500	3
Poland	Public	97.87	0.1	499	2.66	493	2.86	507	2.46
Poland	Private	2.13	0.1	554	11.74	557	11.86	563	10.76
Poland	Other	a	a	a	a	a	a	a	a
Poland	All			500	2.60	495	3	508	2
Portugal	Public	85.53	2.7	485	3.31	482	3.12	489	3.13
Portugal	Private	14.47	2.7	516	9.21	514	10.39	516	9.27
Portugal	Other	a	a	a	a	a	a	a	a
Portugal	All			489	3.10	487	3	493	3
Slovak Republic	Public	91.01	2.38	475	3.03	495	3.47	489	3.29
Slovak Republic	Private	8.99	2.38	499	14.34	512	15.53	505	12.74
Slovak Republic	Other	a	a	a	a	a	a	a	a

Appendix E, continued

Country	School Type	Percent School Type	Percent School Type (SE)	Reading Mean Score	Reading Mean Score (SE)	Math Mean Score	Math Mean Score (SE)	Science Mean Score	Science Mean Score (SE)
Slovak Republic	All			477	2.50	497	3	490	3
Slovenia	Public	97.34	0.06	481	1.05	499	1.23	509	1.16
Slovenia	Private	2.66	0.06	561	6	596	7.25	598	7.27
Slovenia	Other	a	a	a	a	a	a	a	a
Slovenia	All			483	1.00	501	1	512	1
Spain	Public	65.92	0.88	469	2.28	473	2.37	478	2.43
Spain	Private	34.08	0.88	505	3.76	504	3.73	509	3.4
Spain	Other	a	a	a	a	a	a	a	a
Spain	All			481	2.00	483	2	488	2
Sweden	Public	89.96	0.82	494	2.84	491	2.88	492	2.71
Sweden	Private	10.04	0.82	529	11.08	521	11.43	521	11.47
Sweden	Other	a	a	a	a	a	a	a	a
Sweden	All			497	2.90	494	3	495	3
Switzerland	Public	91.87	2.1	500	2.61	534	3.48	516	2.98
Switzerland	Private	6.26	1.57	518	9.63	541	11.67	529	7.94
Switzerland	Other	1.86	1.43	443	17.33	492	21.66	480	19.17
Switzerland	All			501	2.40	534	3	517	3
Turkey	Public	99.21	0.56	464	3.59	444	4.49	453	3.65
Turkey	Private	0.79	0.56	546	2.25	571	4.91	545	4.81
Turkey	Other	a	a	a	a	a	a	a	a
Turkey	All			464	3.50	445	4	454	4
UK	Public	93.52	1.09	492	2.54	490	2.74	510	2.81
UK	Private	6.31	1.1	553	5.37	546	5.69	583	6.81
UK	Other	0.17	0.1	504	11.47	491	4.6	512	3.47
UK	All			494	2.30	492	2	514	3
USA	Public	91.18	1.37	494	3.35	482	3.55	496	3.41

Appendix E, continued

Country	School Type	Percent School Type	Percent School Type (SE)	Reading Mean Score	Reading Mean Score (SE)	Math Mean Score	Math Mean Score (SE)	Science Mean Score	Science Mean Score (SE)
USA	Private	8.82	1.37	565	15.28	543	13.62	564	18.4
USA	Other	a	a	a	a	a	a	a	a
USA	All			500	3.70	487	4	502	4

NOTES: SE = Standard Error, a = not applicable
SOURCE: OECD PISA 2009 Data File - Interactive Selection based on school surveys asking principals to indicate if their school was "Private" or "Public". France respondents did not answer this question so only the scores for the entire country are listed here.

Appendix F. 2010 Monthly *Oportunidades* payouts (USD)*

Elementary Grade	Boys	Girls
3	11.49	11.49
4	13.48	13.48
5	17.45	17.45
6	22.99	22.99

Middle School	Boys	Girls
7 (1st)	33.7	35.67
8 (2nd)	35.67	39.26
9 (3rd)	37.67	43.22

High School	Boys	Girls
10 (1st)	56.7	65.03
11(2nd)	60.67	69.39
12(3rd)	64.24	73.35

***** 1 USD = 12.6 MXP (Mexican Pesos)
SOURCE: SEDESOL 2010

Appendix G. The Mexican Public School System

	School Categories	Targeted Student Ages	Equivalent Grades in the U.S.	Types of Schools
Basic Education	Pre-Primary Education	3 to 5	Pre-K and Kindergarten	N/A
	Primary Education	6 to 11	Grades 1 to 6	1) Traditional Schools 2) Technical Schools (vocational in nature) 3) Community schools (target indigenous, and smaller populations) 4) Distance learning schools
	Lower Secondary Education	12 to 14	Grades 7 to 9	1) Traditional schools **2) Technical schools (vocational in nature)** 3) Community schools (target indigenous, and smaller populations) **4) Distance learning schools (called *telesecundarias* and rely on television programming to deliver lessons)**
Upper Secondary Education	Upper Secondary Education	15 to 17	Grades 10 to 12	1) General baccalaureate (general college preparation) **2) Technical baccalaureate (prepare students to work in agriculture, ocean science and technology, industrial technology, or general science and technology)** 3) Professional technical schools or National Colleges of Professional Technical Education (CONALEP) 4) National and state job training centers to prepare students for jobs ranging from tourism to printing systems
Tertiary Education	Senior Technician	18 and older	N/A	Technical universities (including teacher universities)
	Degree-granting	18 and older	N/A	Grant undergraduate degrees
	Graduate	18 and older	N/A	Specialized degrees, masters and doctorate degrees

SOURCES: Hopkins, et al. 2007 and the Mexican Education Ministry Web site (http://www.sems.gob.mx)
NOTE: School types in bold are the school types that were surveyed for this chapter

Appendix H. Chapter V Hypotheses

***Hypothesis 5.1*:** Middle school students who benefit from *Oportunidades* are at least as likely as their peers who do not benefit from *Oportunidades* to go on to high school

***Hypothesis 5.2*:** Female middle school students who benefit from *Oportunidades* are at least as likely as their male counterparts to go on to high school

***Hypothesis 5.3*:** Middle school students who benefit from *Oportunidades* are at least as likely as their peers who do not benefit from *Oportunidades* to want to attain a higher level of education than their parents

***Hypothesis 5.4*:** High school students who benefit from *Oportunidades* are at least as likely as their peers who do not benefit from *Oportunidades* to want to attain a higher level of education than their parents

***Hypothesis 5.5*:** Male high school students who benefit from *Oportunidades* will be at least as likely as their peers who do not benefit from *Oportunidades* to seek nonagricultural jobs

***Hypothesis 5.6*:** Students who go to technical middle schools are more likely to plan to go on to high school than students who go to *telesecundaria* middle schools

Appendix I. Student Surveys

Q1. Date of Birth? Day: ____ Month:____ Year: _____
Q2. Sex: Female / Male
Q3. Mark the number that is closest to your overall grade last year in school:
6 7 8 9 10

Q4. Have you repeated a year or a semester of school? (Mark only one option in each box).

	No, never	**Yes, once**	**Yes, two or more times**
a. In primary school			
b. In middle school			
c. In high school			

Q5. To what extent do you agree or disagree with the following statements:

	Strongly Disagree	Disagree	Agree	Strongly Agree
a. School has done little to prepare me for adult life when I leave school	☐	☐	☐	☐
b. School has been a waste of time	☐	☐	☐	☐
c. School has helped give me confidence to make decisions	☐	☐	☐	☐
d. School has taught me things which could be useful in a job	☐	☐	☐	☐

Q6. If you agree or strongly agree that school has taught you things that could be useful in a job, what skills or knowledge have you gained that are most useful?

Q7. *Middle school survey reads:* Do you plan to go on to high school or vocational school after graduation?
***High school survey reads*: Do you plan to go on to vocational school or university after graduation?**
Yes/No …
Q7.a. If you do *not* plan on more education, what do you plan to do with your time?
Q7. b. If you *do* plan for more education:
7.b.1. Where do you plan to go?
7.b.2. What do you plan to do after graduation?

Q8. Does your family receive funds from *Oportunidades*? Yes /No
Q9. Does your family receive other government benefits that you know of? Yes /No
Q9.a. If yes, which programs?
Q9.b. Has the receipt of these benefits made it easier for you to go to school? Yes No
Q9. c. If Yes, how have they made going to school easier?

Appendix I, continued

Q10. What do you like *most* about school?
Q11. What do you like *least* about school?
Q12. In the future (when you grow up), how do you want to earn a living?

Section 2: Family and Home Information
Q13. Who usually lives at home with you?

	Yes	No
Mother (including stepmother or foster mother)		
Father (including stepfather or foster father)		
Sister(s), (including stepsisters)		
Brother (s), (including stepbrothers)		
Grandparent(s)		
Others (e.g. cousin)		

Q14. What is your mother's main job?
Q15. What is your father's main job?

Q16. What is the highest level of schooling completed by your mother and father?

	None	Primary	Secondary	High school/ Technical	College or University/ Vocational
Mother	☐	☐	☐	☐	☐
Father	☐	☐	☐	☐	☐

Q17. Do you speak a dialect (náhuatl, mexicano) at home? Yes/No
Q17b. If "Yes", what?

Q18. Which of the following are in your home?

	Yes	No
a. A room of your own		
b. A computer you can use for schoolwork		
c. Internet		
d. Books to help with schoolwork (e.g., a dictionary)		
e. A TV		
f. A DVD player		
g. A refrigerator		
h. A hard floor (piso firme)		
i. A washing machine		

Appendix J. Principal Surveys

Q1. As of May 1, 2012 what was the total school enrollment (number of students)?
(Please write a number in each line. Write 0 (zero) if there are none.)

a) Number of boys: _____ b) Number of girls: _____

Q2. How many of the following teachers are on the staff of your school? Include both full- and part-time teachers. A full-time teacher is employed at least 90% of the time as a teacher for the full school year. All other teachers should be considered part-time. (Please write a number in each space provided. Write 0 (zero) if there is none.)

	Full-time	**Part-time**
Total Teachers		
Teachers certified by the SEP (Maestros certificados por la Secretaría de Educación Pública)		
Teachers with other qualifications (Maestros egresados de una licenciatura en educación normalista, licenciatura universitaria, licenciatura tecnológica, especialización o maestría)		

Q3. Is your school's capacity to provide instruction hindered by any of the following issues? **(Please tick one box in each row)**

	Not at all	**Very little**	**To some extent**	**A lot**
a) A lack of qualified science teachers				
b) A lack of qualified mathematics teachers				
c) A lack of qualified English teachers				
d) A lack of qualified teachers of other subjects *Which subjects?*				
e) A lack of library staff				
f) A lack of other support personnel				
g) Shortage or inadequacy of science lab equipment				
h) Shortage or inadequacy of instructional materials (e.g. textbooks) ***which materials?***				
i) Shortage or inadequacy of computers for instruction				
j) Lack or inadequacy of Internet connectivity				
k) Shortage or inadequacy of computer software for instruction				
l) Shortage or inadequacy of library materials ***Which materials would be helpful?***				
m) Shortage or inadequacy of audio-visual resources				

Q3n. Additional details about what they are lacking:

Appendix J, continued

Q3.o. What do you see as the top 3 challenges for educating students in your school? In general? (Are they the same?)

Q4. Approximately how many computers are available in your school?

a) What are they primarily used for?
b) Approximately how many of these computers are connected to the Internet?
c) Where are they located in the school?
d) How often do students have access to the computers?
Daily Weekly Once a month

Q5. Does your school have a library? Sí / No

a) If yes, approximately how many books? _____
b) How long can students keep books out for?
c) Do you have any newspaper subscriptions? Sí / No
C1. If no, would you want some? Which ones?
C2. If yes, which ones?
d) Do you have any magazine subscriptions? Sí / No
D1. If no, would you want some? Which ones?
D2. If yes, which ones?

Q6. Regarding your school, who has a considerable responsibility for the following tasks? (Please tick as many boxes as appropriate in each row)

	Principals	**Teachers**	**School Governing board**	**Regional or local education authority**	**National education authority**
a) Selecting teachers for hire					
b) Firing teachers					
c) Establishing teachers' starting salaries					
d) Determining teachers' salaries increases					
e) Formulating the school budget					
f) Deciding on budget allocations within the school					
g) Establishing student disciplinary policies					
h) Establishing student assessment policies					
i) Approving students for admission to the school					
j) Choosing which textbooks are used					

Appendix J, continued

	Principals	Teachers	School Governing board	Regional or local education authority	National education authority
k) Determining course content					
l) Deciding which courses are offered					

Q7. Regarding your school, which of the following bodies exert a direct influence on decision making about staffing, budgeting, instructional content and assessment practices? (Please tick as many boxes as apply)

	Area of Influence			
	Staffing	Budgeting	Instructional Content	Assessment Practices
a) Regional or national education authorities (e.g. inspectorates)				
b) The school's council or governing board (El consejo escolar y órgano de gobierno de la escuela)				
c) Parent groups (Grupos de padres de familia)				
d) Teacher groups (Grupos de maestros (ej. asociaciones, comités de planes de estudios, sindicato))				
e) Student groups (e.g. Student Association, youth organisation) (Grupos de alumnos (ej. asociación de alumnos, organización de jóvenes))				
f) External examination boards (Consejos externos de evaluación)				
g) When a teacher has a problem en their classroom, (Cuando un maestro tiene un problema en su salón de clases, tomo la iniciativa de hablar sobre eso con él)				
h) Informo a los maestros sobre cómo actualizar sus conocimientos y competencias				
i) Me cercioro de que las actividades que ocurren en las clases van de acuerdo con nuestra metas educativas				

Appendix J, continued

Q8. **About what percentage of students in your school repeated a grade last academic year? (Please write a number in each row. Write 0 (zero) if nobody repeated a grade.)**

	The approximate percentage of students repeating this grade	**Grade not available in this school**
a) First grade of middle school (Primer grado de Secundaria)/7th grade		
b) Second grade of middle school (Segundo grado de Secundaria)/8th grade		
c) Third grade of middle school (Tercer grado de Secundaria)/9th grade		
d) First grade of high school (Primer grado de prepa)/10th grade		
e) Second grade of high school (Segundo grado de prepa)/11th grade		
f) Third grade of high school (Tercer grado de prepa)/12th grade		

Q9. About what percentage of your total funding for a typical school year comes from the following sources? **(Please write a number in each row. Write 0 (zero) if no funding comes from that source.)**

	%
a) Local Government (includes departments)	
b) Municipal Government	
c) Regional Government	
d) State Government	
e) National Government	
f) Student fees or school charges paid by parents	
g) Benefactors, donations, bequests, sponsorships, parent fund raising	
h) Other	
TOTAL	100%

Q10. About what percentage of your total funding for a typical school year goes to the following sources? **(Please write a number in each row. Write 0 (zero) if no funding comes from that source.)**

	%
a) Teachers	
b) Non-Teacher Personnel (Administrative, teaching assistants, etc)	
c) Building maintenance/infrastructure	
d) Curriculum/teaching materials	
e) Financial aid (meals, fees, etc)	
f) other (describe)	
Total	100%

Appendix J, continued

Q11. May I see a copy of your budget? Yes / No
Q12. Approximately what percent of your student population receives *Oportunidades* monies?

a. Do you think *Oportunidades* has helped keep students in school?

Q13. What percent of your graduating students do you think will go on to …

	%
High school	
Vocational school	
College/university	

Q14. For those students that do not go to high school or vocational school, what types of jobs do you think they will have next year? In 5 year's time?

Q15. How much of an impact do you think school has had on your students in terms of their future? A lot / a little / Not much / None

Appendix K. Occupation Rankings

Level	Description/Criteria	Occupations	High School student Preferences*
1	• Manual labor intensive • Worker does not need to be literate • No formal education required	• Day laborer • Homemaker • Launderer • Shoe shiner • Builder's assistant	1 (1%)
2	• Some manual labor required (though less than for level 1 jobs) • Some literacy and math skills needed • Primary education helpful if not required	• Taxi driver • Truck/delivery truck driver • Painter • Farmer • Rancher • Seamstress • Stylist • Cook • Soldier • Security guard • Street or small shop vendor	1 (1%)
3	• May require some manual labor • Worker needs to be literate • An elementary if not middle school education would be helpful if not required – no certification or degrees are necessary	• Auto mechanic • Plumber • Carpenter • Blacksmith • Chef • Secretary • Miner • Electrician • Librarian • Fireman • Builder/basic construction	10 (10%)
4	• Requires a low level university or vocational degree	• Teacher • Nurse • Police Officer • Accountant • Administrator • Network engineer/computer systems expert	60 (59%)
5	• Requires a high level university degree	• Lawyer • Medical doctor • University professor/researcher • Architect • Engineer	29 (29%)

*Of the 132 high school students who responded to survey questions, 101 (77%) answered this question (Q12). The middle school students who responded to survey questions varied considerably at the individual level. For example, one student wanted to either become a doctor or work in a rodeo. Due to the nature of student responses, only high school student responses could be coded with clarity and these are reported.